KYOCERA

CONTAX RTS III

Repair Manual

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CONTAX RTSIII Specifications

Type	35mm focal-plane shutter auto/manual exposure SLR
Picture Size	24 x 36mm
Lens Mount	Contax/Yashica mount
Shutter	Electronic quartz-controlled, vertical-travel, metal focal-plane shutter
Shutter Speeds	32 seconds to 1/8000 sec. in auto mode; 4 seconds to 1/8000 sec., B (bulb), X (1/125, 1/250sec.) in manual mode
Flash Synchronization	X-synch at 1/250 sec. (or slower) via direct hot-shoe or X-synch terminal
Shutter Release	Electromagnetic w/exposure check function by half depressing top release; additional side release (w/lock) for vertical camera positioning, cable release socket, and dedicated B (bulb) cable release socket
Self-timer	Quartz-controlled, electronic self-timer with either 10 or 2 sec. delay (selectable); Cancelable during operation; Blinking LED together with film counter indicates remaining (countdown) time
Exposure Modes	Aperture priority auto exposure; Shutter speed priority auto exposure; Manual exposure; TTL auto flash; Pre-flash TTL auto flash; Pre-flash TTL metering manual flash
Metering System	TTL full-aperture, center-weighted average metering / TTL full-aperture spot metering (switchable); Two SPDs (Silicon Photo Diode) provided, one on the upper portion of the pentaprism (center-weighted), and the other at the bottom of the mirror box (spot)
Metering Range	EV0 to 21 for full-aperture, center-weighted average metering, EV3 to 21 for spot metering (ISO 100, f/1.4 lens)
Film Speed Range	ISO 25 to 5000 in DX auto mode; ISO 6 to 6400 in manual mode
Exposure Check	Indication either by pushing the dedicated exposure check button or depressing the release button half way (indication remains visible for 16 seconds)
AE Lock	Image plane exposure value is stored by operating the main switch; Available in either center-weighted or spot metering
Exposure Compensation	±2EV (presettable in 1/3EV increments)
ABC Mechanism (Automatic Bracketing Control)	3-frame continuous compensation in the order of standard, over-and under-exposure (range switchable, ±0.5EV or ±1.0EV); Usable in aperture priority AE, shutter speed priority AE or manual exposure control
Flash Modes	TLA direct shoe, and via synch terminal connection; TTL direct flash control possible with TLA flash system; Pre-flash TTL spot metering function built-in; Second shutter curtain synch possible with Contax TLA 280 flash unit
Viewfinder	Fixed pentaprism, eye-level with long eyepoint; approx. 100% field-of-view, 0.74x magnification with 50mm lens focused at infinity; built-in eyepiece shutter
Dioptric Adjustment	Internally adjustable from +1D to -3D
Focusing Screen	Standard split image/microprism collar (interchangeable)
Viewfinder Display	Shutter speed, under-/over-exposure, film counter, ABC display, pre-flash display, flash status indicator, aperture, exposure mode, exposure compensation warning, light metering mode
External LCD display	Film counter, film transport indicator, battery warning
Film Loading	Automatic motor advances film to frame "01" once release button is pressed
Film Advance	Automatic motor; When continuous shooting HIGH selected, approx. max. 5 frames per second, LOW mode, approx. max. 3 fps
Drive Mode	Mode selector dial; Single, continuous LOW or HIGH, 2 or 10 sec. self-timer, multiple exposure
Film Rewind	Automatic rewind/stop by operating lock release button and rewind lever (film leader remains outside cassette)
Mutiple Exposure	Possible by presetting the drive mode selector (automatic reset, presetting required for each frame)
Exposure Counter	Automatic resetting (additive type); Countdown in rewinding; Exposure time displayed in "B" shooting; Compensation status indicated when using ABC function
Depth-of-Field Preview	By pushbutton (effective in aperture priority AE, manual exposure)
Mirror-up Mechanism	Dedicated lever
Camera Body Construction	Diecast aluminum alloy for main body, diecast magnesium alloy for top cover, and titanium for bottom cover
Film Pressure Plate	Ceramic; Vacuum mechanism combined
Date Imprinting Device	Data back provided as standard (imprinting made in between frames); Imprinting of year/month/day, day/hour/min., no imprint, month/day/year, day/month/year (selectable); 3V lithium battery used for date imprinting (CR2025)
Power Source	1.5V AA-size batteries x 6 or one lithium battery (2CR5).
Battery check	Automatic voltage check (confirmed on the display panel by turning on the main switch)
Dimensions & Weight	156(W) x 121(H) x 66(D)mm (6-3/16 x 4-13/16 x 2-5/8 in.), 1,150g (2.53 lbs) (batteries not included)

*Specifications and external features subject to change without prior notice.

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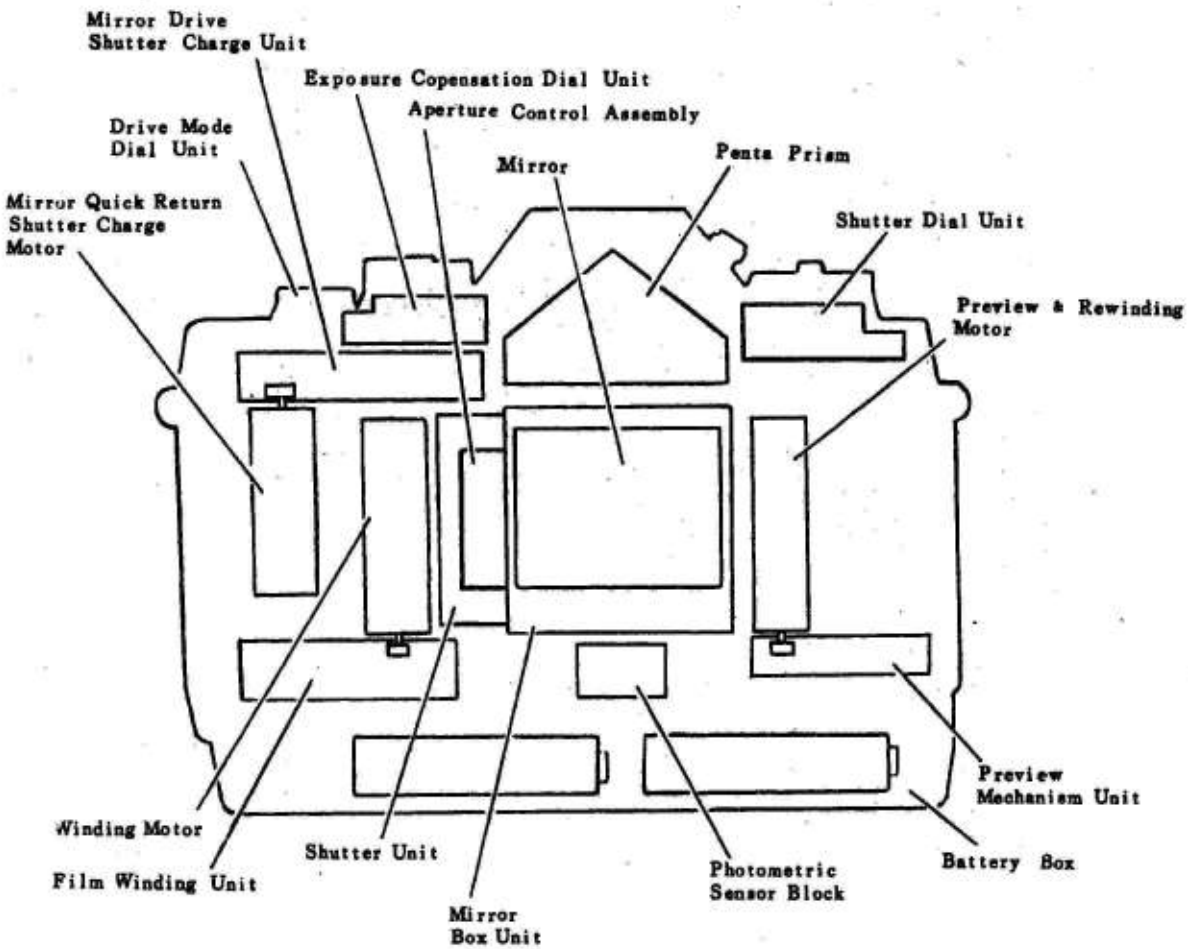
Internal Structure

The internal structure of CONTAX RTSⅢ centers around the mirror box unit and shutter unit in the middle. To the left (viewed from front) are the winding motor and the mirror drive and shutter charge motor.
Those mechanism units are arranged in their independent positions above and below the film winding spool chamber. On the right side of the mirror box are the preview mechanism and rewinding motor, to which the mechanism unit is connected. In the upper part of the body, there are the penta prism and finder unit in the middle. To the left of them are the drive unit and exposure compensation dial unit, and to the right are the shutter dial and shooting mode selector unit, which are both connected to the external operation block.
In the bottom of the camera body is the battery box to hold six SUM-3 size AA batteries.



〔Internal Structure〕

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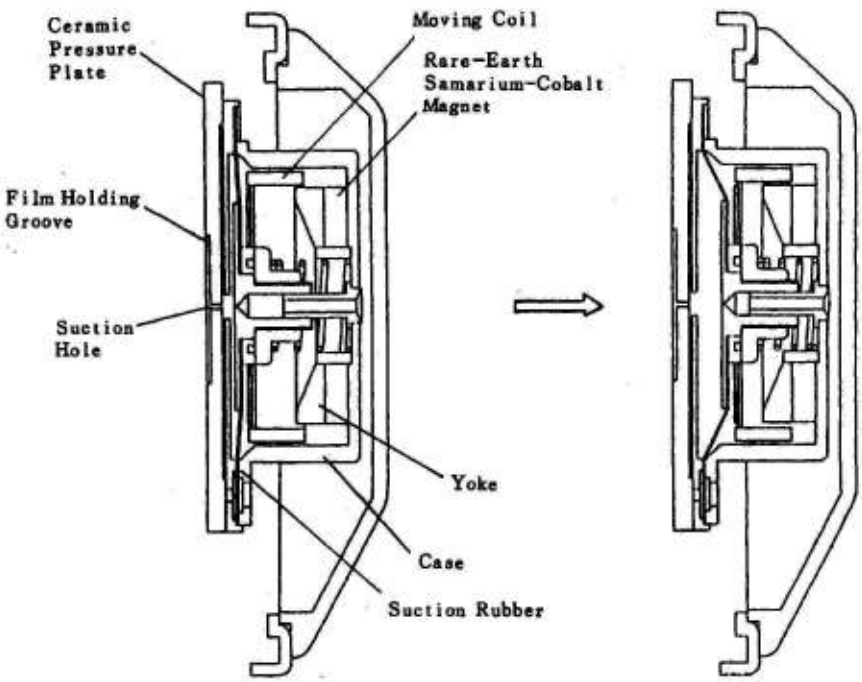
RTV (Real-Time Vacuum) Mechanism

This vacuum mechanism installed on the back of tne pressure plate holds the film against the pressure plate under suction through the suction hole in the plate.

In this mechanism, a strong magnetic field is generated in the yoke gap by a rare-earth samarium-cobalt magnet. And the force created by the current flowing through the coil in the gap pulls back the suction rubber connected to the coil and thus attracts the film onto the pressure plate surface via the suction hole in it.

In holding under suction the film against the pressure plate, the flatness of the pressure plate is of critical importance.

Accordingly, the pressure plate is made of a ceramic, which features a stable perfomance and a flatness of 5 μm or less.



〔Sectional View of Vacuum Mechanism〕

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1. Vacuum function

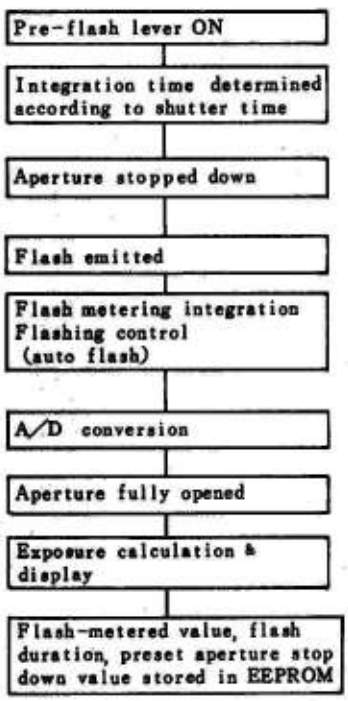
The vacuum function operates at the reception of ON signal from tne camera. The signal can be output at any time.

2. Vacuum operation

- o The vacuum operation starts immediately before mirror-up.
- o The vacuum operation ends after second curtain run.
- o Even When the drive mode is "continuous", the start and end timing of vacuum operation are the same as in "single" mode. (Suction and release are repeated for each frame.)
- o The camera supplies the vacuum signal and power (battery).
- o The vacuum operation is inhibited when the B1(BC " " mark lit) alarm is on.
- o Suction continues automatically for 32 seconds.
- o The vacuum function does not operate when there is no film in the camera.

Pre-flash TTL Spot Metering

Turn the pre-flash lever on, then a flash signal sets off the flash by turning on the triac (bi-lateral current control element) at a command from tne CPU. Then the flash light reflected from the subject is led in via a sub-mirror in back of the main mirror. Upon this, the pin photodiode combined with an amp at the bottom of the mirror box meters Ø5 portion in the center of the focusing screen. The result of this metering is displayed in a bar graph in a range of ±2EV within the viewfinder. This display changes as the aperture stop down value is changed. When the TTL auto flash is on, the pre-flasn function not only controls the flash emission, but also memorizes the flash duration. The actual flash duration will be controlled in accordance with this memorized data.


Pre-flash lever ON
Integration time determined according to shutter time
Aperture stopped down
Flash emitted
Flash metering integration Flashing control (auto flash)
A/D conversion
Aperture fully opened
Exposure calculation & display
Flash-metered value, flash duration, preset aperture stop down value stored in EEPROM

〔Pre-flash Operation Sequence〕

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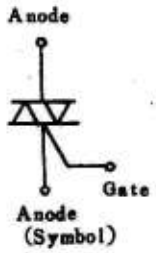
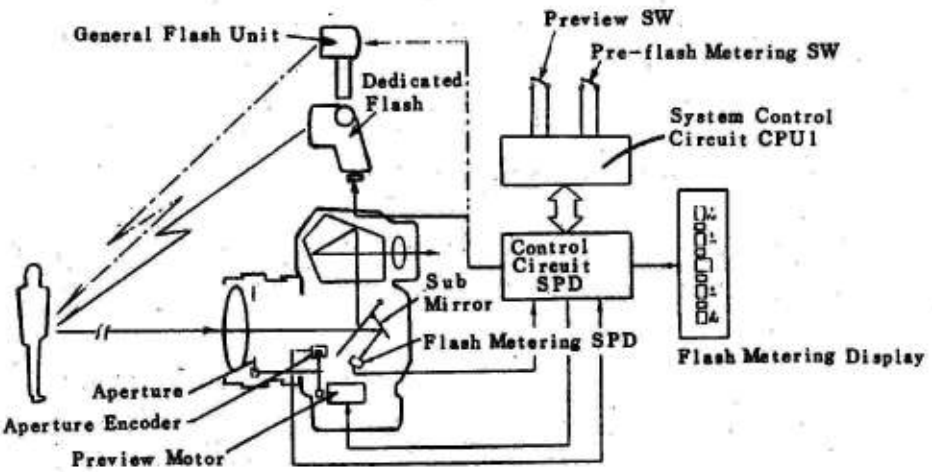
When the TTL auto flash is used, the pre-flash funciton causes a display of metering result within the viewfinder, and the exposure display changes in linkage with the change in the aperture. The flash-metered value, flash duration and preset aperture stop down value are all stored in the EEPROM. Since they are kept there even through the replacement of batteries, the desired flash sooting can be resumed. Note also that setting the pre-flash lever in the OFF position turns on the TTL direct metering flash shooting mode.

* Triac: 3-electrode a.c.power control element. A triac has a symmetrical characteristic of NPNPN in the forward and reverse directions. It controls the currents in both directions by passing current through a gate.



* EEPROM (Elecfrically Erasable Programmable Read Only Memory): This read-only memory for microcomputer allows rewriting of the contents by a special procedure. The memory is protected even when the main power is cut off.



〔Flash Metering System〕

1. Flash metering range

ISO 25-800 (not inciuding exposure compensation)

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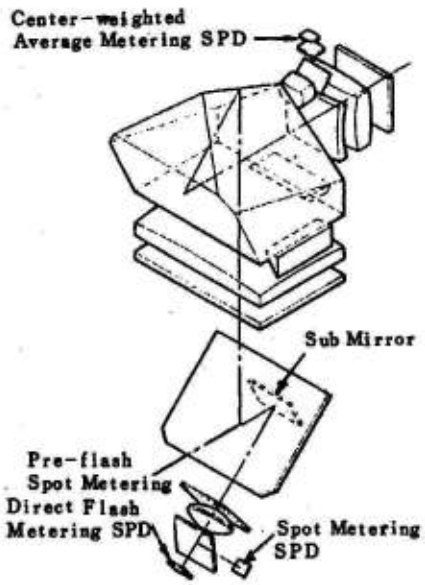
Exposure Control

1. Center-weighted average metering

The center-weighted average metering SPD is so located that the center-portion of the diffuse surface of the focusing screen can be metered via an aspherical lens and mirror.



Metering Configuration

2. Spot metering

Spot metering, pre-flash TTL spot metering and direct flash film-surface metering are performed with the respective SPD's located in the bottom of the mirror box. Light passing through the middle of the main lens is reflected by the sub-mirror behind the main mirror, passed through a filter and condensing lens, then divided by a half mirror into transmitted light and reflected light. The reflected light is led into the general light spot metering SPD, whereas the transmitted light is led into the pre-flash spot metering/direct flash metering SPD. Spot metering uses the centeral portion of about 3 mm diameter of the focusing screen.

3. ABC (Automatic Bracketing Control)

The ABC function offers automatic exposure compensation for three consecutive frames. The compensation is done in the order of normal, over and under.

- o Aperture priority AE, manual: Control of shutter speed
- o Shutter speed priority AE : Control of aperture
  (The shutter speed is controlled automatically when the aperture control range is surpassed.)

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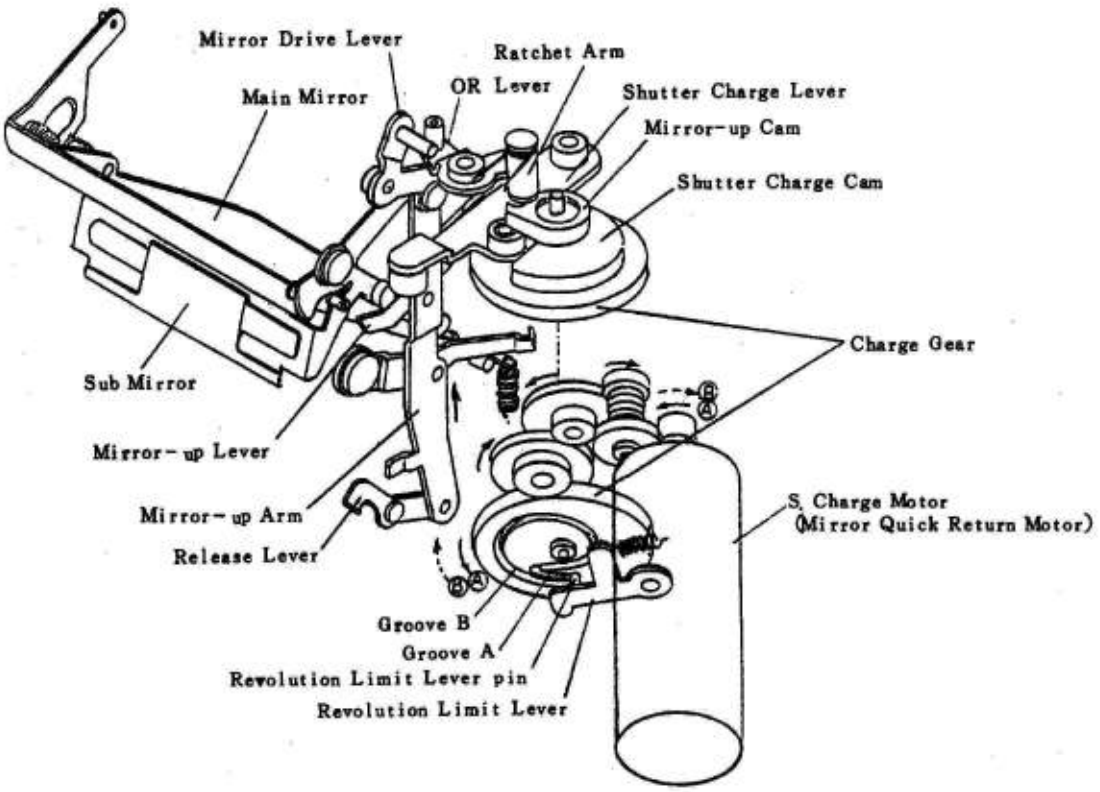
Principal Mechanisms

1. Mirror Drive Mechanism

The S. charge motor connects to the charge gear via a reduction gear train. This charge gear, combined with a shutter charge cam and mirror-up cam, is provided with revolution angle limit grooves.

The revolution limit lever can move along these grooves. As the S. charge motor runs in the Ⓐ direciton, the mirror-up cam pushes the ratchet arm, raises the mirror-up arm, and at the same time pushes up the mirror-up lever, thus raising the mirror. The pin in the groove A of the charge gear comes to a stop at the first stopper. But immediately before that the mirror-up is completed, with the MU switch turning on. 5 msec.after the receipt of this signal, the S. charge motor stops its forward run.

Immediately before the completion of mirror-up, the shutter is started by the release lever.



〔Mirror Drive Mechanism〕

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After the shutter motion, the S. charge motor reverses. This causes the pin in the groove of the charge gear to move into the groove B and the charge gear to rotate to the beginning stop position.

In the meantime, the mirror lowers with the return of the mirror up cam, and at the same time the shutter charge cam pushes the shutter charge lever and the roller at the end charges the shutter. Simultaneously with the charging of the shutter, the revolution limit lever pin moves to the left along the groove, turning on the charge switch on its way to the leftmost position.

Just before the end of shutter charge revolution, the revolution limit lever moves to the right, turns off the charge switch and stops the charge gear rotation mechanically at the end of the groove.

As the charge switch is turned off, power for the motor run in shutter charge direction is shut off.

2. Film Transport Mechanism

The film transport sequence comprises the high-speed drive mode, in which a parallel drive is done almost simultaneously with shutter charge, and the low-speed drive mode, in which a series drive is done after shutter charge.

The film transport mechanism employs a spool drive system. As the winding motor inside the spool is driven, the film is wound by the revolution of the spool via a gear train.

Film frame positioning is done by a reliable mechanism that causes the single-revolution limit lever to jump into the single-revolution limit cam connected coaxially to the sprocket. At the same time, as the single-revolution limit switch, linked to the single-revolution limit lever, turns off, power to the winding motor is cut off and the counter counts up.

Immediately before the start of the next winding, the solenoid plunger, upon receipt of an electric signal, operates to release the single-revolution limit lever. Thus this mechanism is completely independent of the shutter charge and other mechanisms, so that there is no film movement at multi- exposure.

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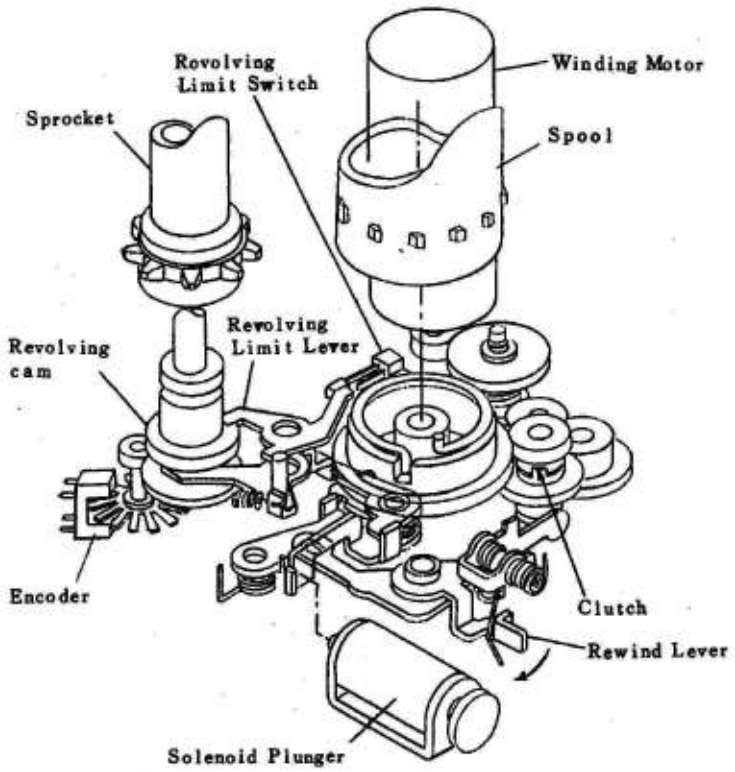
3. Film Rewind

Push the rewind lever in the direction of the arrow, and the clutch between the winding gears (8) and (9) will be disengaged from the motor, thus releasing the spool. At the same time, the lever operation will release the revolving limit lever from the revolving limit cam.
Accordingly, the sprocket will be released and the rewind switch will be turned on. An "ON" signal from the rewind switch will energize the rewind motor to start rewinding. During rewinding, the encoder, interlocked with the sprocket, stops all the other mechanisms than the reverse frame counter and film reader. After completion of rewinding and film replacement, the system returns from rewind mode to winding mode at the start of auto loading.



〔Film Advance Mechanism〕

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4. Preview Mechanism

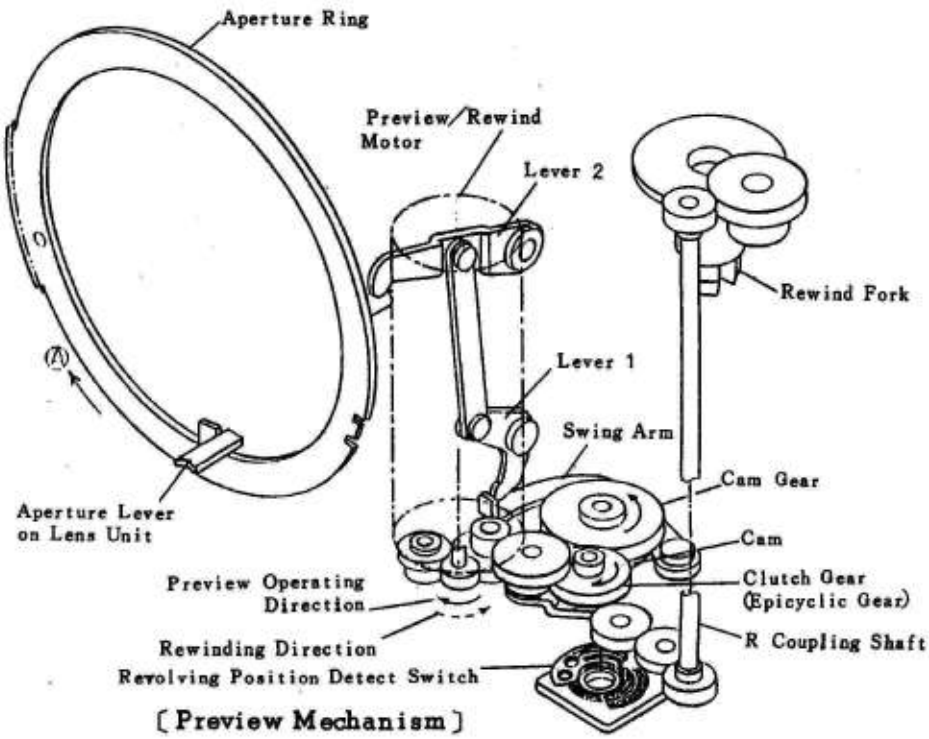
The unique preview mechanism of this camera is driven by a motor which also serves as the drive for rewinding. This setup was chosen to automate the aperture stop down for the functioning of the pre-flash spot metering mechanism. In preview operation, the motor turns clcokwise (in the direction of the arrow shown in a solid line) and drives the gear train including the clutch gear (epicyclic gear) and the cam under the cam gear. When the cam rotates in the direction of the arrow, the swing arm moves to the right. As a result, the lever 1 pulls down the lever 2 and turns the aperture ring in the direction of the arrow Ⓐ until the lens is stopped down to a predetermined aperture. When the cam rotates in the opposite direction, the gear train moves the aperture ring from the minimum-aperture position to the full-aperture position. Thus, the mechanism repeats closing and opening the aperture. The revolving position detect switch connected to the cam gear operates to stop the aperture ring correctly at the full-aperture position or the minimum-aperture position.

This way the preview mechanism allows the checking of aperture stop down by easy button operation.

The preview mechanism whose circuit is interlocked with the lever for operating the flash meter, operates the motor for aperture stop down and lights the flash. After flashing, the aperture ring returns to the full-aperture position again.

The unique structure permits instantaneous flash metering with the aperture stopped down to the preset value.

In film rewinding, as the motor is reversed, the clutch gear (epicyclic gear) disengages from the cam gear and engages with the R gear. Therefore, the R coupling shaft is driven via the gear train and the rewind fork connected to the top of the cartridge is turned to perform film rewinding.



〔Preview Mechanism〕

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Mechanism of Assemblies

1. Shutter Charge Unit

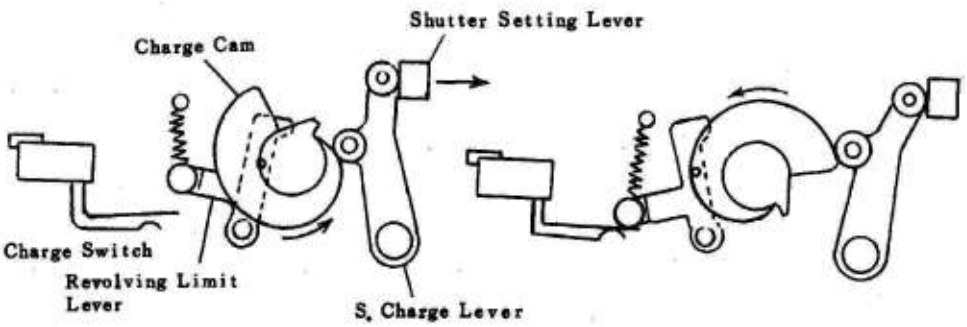
Like the CONTAX 137MD, this camera performs shutter charge, aperture control stopper setting and multi-exp. lock lever release by means of the normal and reverse runs of a motor.
The motor also drives the mirror and the aperture ring via the mirror-up base plate unit.

(1) Shutter Charge Motor

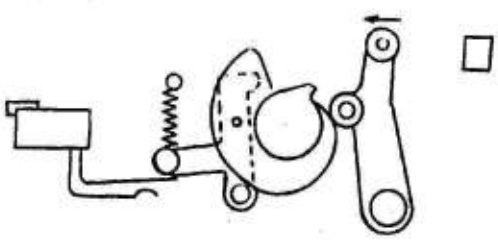
Upon receiving a release signal, the shutter charge motor runs to perform mirror-up, drives the aperture lever (aperture stop down) and activates shutter release. The motor stops when the mirror-up switch is turned on. After shutter operation, the motor reverses to perform mirror-down, aperture opening, release of shutter charge and the multi-exp. lock lever after multiple exposure, and setting of the aperture magnet released in the TV mode. The motor stops when the charge switch (timing switch) is turned off.

(2) S. Charge Lever

After the travel of the second curtain, the charge cam starts reversing and pushes the S. charge lever, thus pushing the shutter setting lever to the right. Shutter setting is completed when the charge cam reverses by about 3/4 of the full travel. Then the shutter charge system returns to the initial state prior to mirror-up.



〔Before Shutter Charge〕　　〔Completion of Shutter Charge〕



〔Stop of Shutter Charge Motor〕

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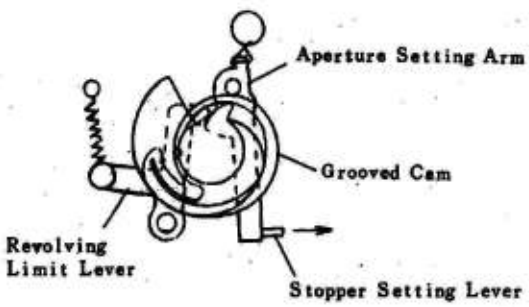
(3) Charge Cam

The charge cam performs three functions.
It rotates to control the mechanical sequence.
Mirror-up, aperture stop down and shutter release are performed by a 70-degree turn of the cam.
The shutter charge system is initialized with the cam reversed by 420 degrees.

(4) Revolving Limit Lever and Aperture Setting Arm

The revolving limit lever and aperture setting arm are mounted on the S. charge lower base plate.

The revolving limit lever, interlocked with the grooved cam on the charge cam, limits the rotation of the charge cam.
The revolving limit lever is almost stationary while the charge cam is turning in the direction of mirror-up. At the initial stage of the shutter charge rotation of the cam, the revolving limit lever moves quickly to the right, so that its end pushes the root of the aperture setting arm. Now the end of the aperture setting arm moves to the right to set the aperture magnet. After that, the revolving limit lever moves along the groove to the left and turns on the charge switch on the way to the leftmost position. Immediately before completion of shutter charge rotation, the revolving limit lever moves to the right to turn off the charge switch and stop the rotation of the charge cam mechaniccally at the end of the groove. Power to the motor for shutter charge is shut off at the turning-off of the charge switch.



(Setting of Aperture Magnet)

(5) QR Lever and Ratchet Arm

Like the CONTAX 137 MD, this camera uses the ratchet arm mechanism to perform mirror-up.
Before mirror-up, the mirror-up cam and the ratchet pin are engaged with each other. Immediatly after start of the Shutter charge motor, the mirror-up cam pushes the ratchet pin and moves the ratchet arm and caulked QR lever in the direciton of mirror-up. Then the roller on the QR lever pushes up the mirror drive lever on the mirror-up base plate ass' y to perform mirror-up and aperture stop down.

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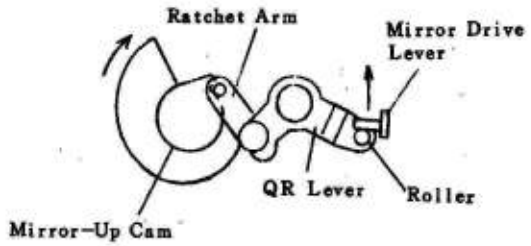
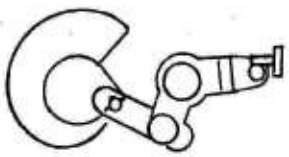
Around the completion of mirror–up, the mirror–up switch is turned on and five milliseconds later the charge motor comes to a stop.
When the shutter charge motor reverses, the mirror–up cam is released for mirror–down and aperture opening.



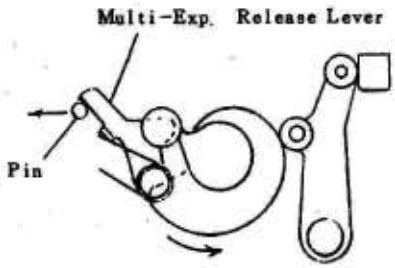
〔Before Mirror–Up〕



〔Completion of Mirror–Up〕

(6) Multi–Exp. Release Lever

The multi–exp. release lever is mounted on the bottom of the shutter charge upper base plate. During the reverse run of the shutter charge motor, the multi–exp. release lever is pushed by the mirror–up cam and moved to the left, pushing the pin on the ISO dial base plate to cancel multi–exposure state.



〔Multi–Exposure Release during Winding〕

2. Mirror–Up Base Plate Ass′y

The mirror up base plate ass′y on the left side of the mirror box, driven by the QR lever on the S. charge unit, performs mirror–up, mirror–down, aperture closing or opening, shutter release and turning on/off of the MU switch.
The illustration (1) represents the initial state prior to mirror–up. The aperture lever, pulled by the apperture lever spring, pushes the aperture ring in the full–aperture direction.

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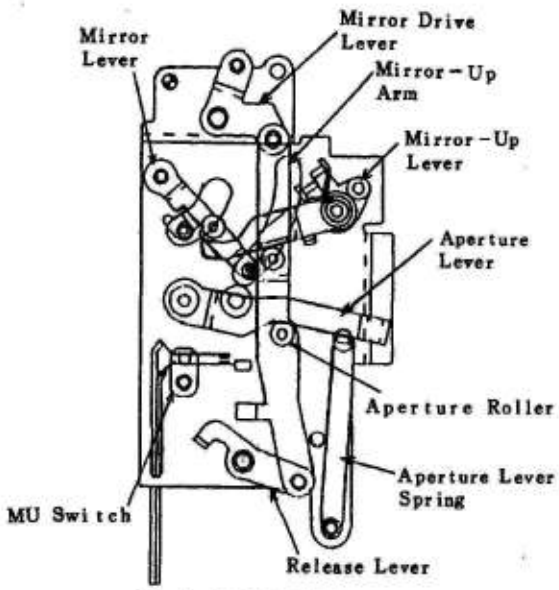
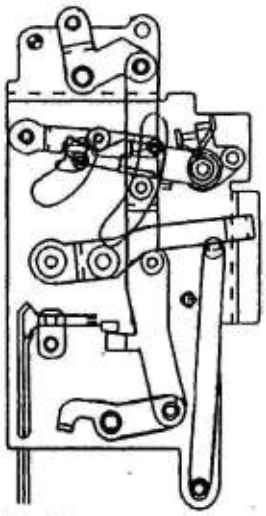
When the mirror drive lever is moved to the left by the QR lever, the mirror-up arm moves upward and the mirror-up roller pushes up the mirror-up lever. The mirror-up lever pushes up the mirror lever, and the two rollers on the mirror lever push up the mirror. The aperture roller pushes up the aperture lever, and the aperture ring, following the aperture lever, moves in the direction of aperture stop.



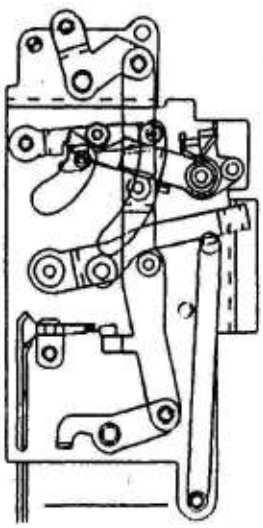
(1) Initial State

During mirror-up operation, the release lever unlocks the shutter release to allow shutter travel.



(2) Shutter Releasing

The illustration (3) shows the linkage position when the MU switch is turned on. Five milliseconds after receiving this "ON" signal, the shutter charge motor stops running.
After shutter travel, the shutter charge motor starts reversing to release the QR lever. Then all the levers on the mirror-up base plate ass' y return to the intial state by the aperture lever spring and other spring force applied in the direction of mirror-down.



(3) MU Switch on

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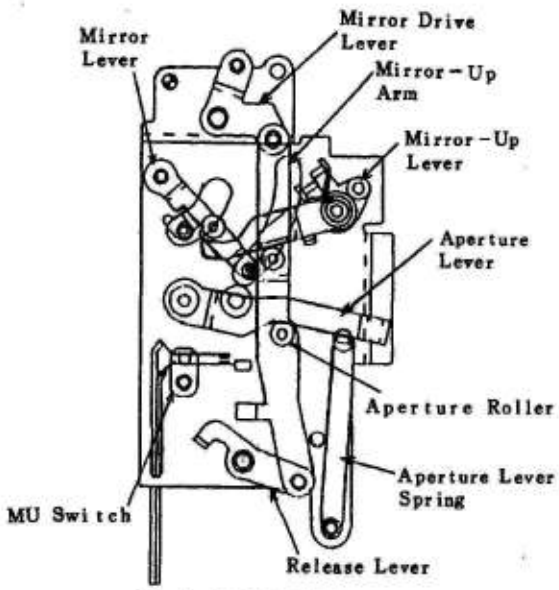
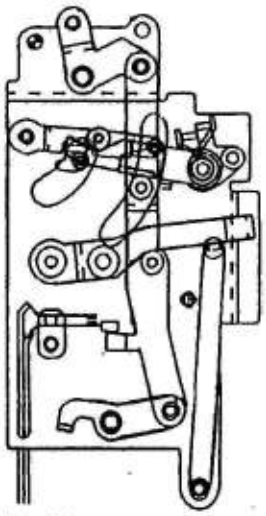
When the mirror drive lever is moved to the left by the QR lever, the mirror-up arm moves upward and the mirror-up roller pushes up the mirror-up lever. The mirror-up lever pushes up the mirror lever, and the two rollers on the mirror lever push up the mirror. The aperture roller pushes up the aperture lever, and the aperture ring, following the aperture lever, moves in the direction of aperture stop.



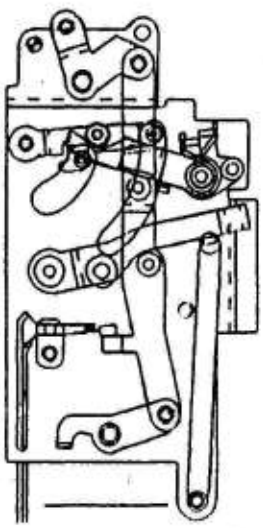
(1) Initial State

During mirror-up operation, the release lever unlocks the shutter release to allow shutter travel.



(2) Shutter Releasing

The illustration (3) shows the linkage position when the MU switch is turned on. Five milliseconds after receiving this "ON" signal, the shutter charge motor stops running.
After shutter travel, the shutter charge motor starts reversing to release the QR lever. Then all the levers on the mirror-up base plate ass' y return to the intial state by the aperture lever spring and other spring force applied in the direction of mirror-down.



(3) MU Switch on

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3. Aperture Control Ass'y

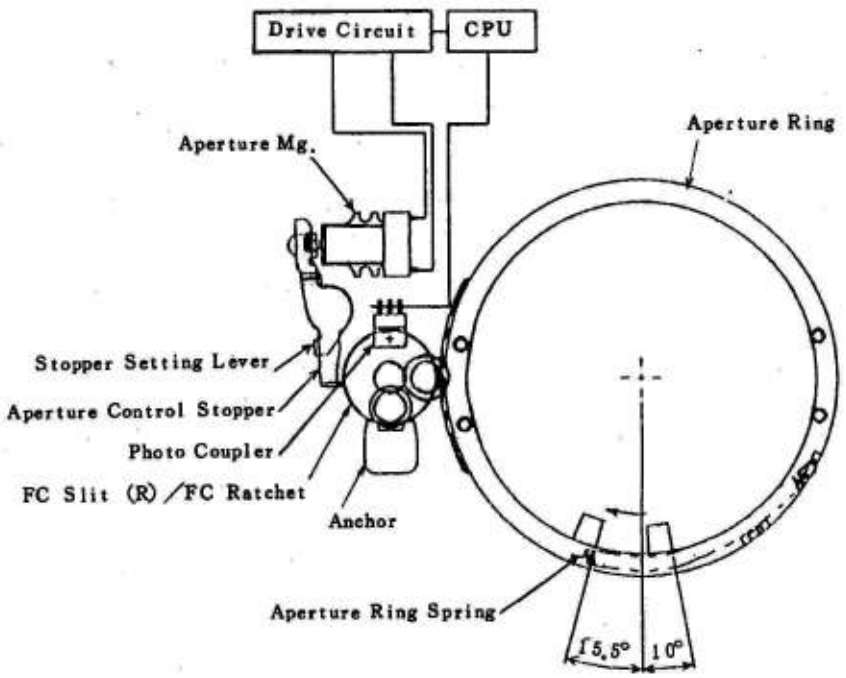
This camera uses the same aperture control mechanism as CONTAX 167 MT. The aperture ring is pulled by the aperture ring spring in the direction of aperture stop down. When the aperture lever is moved upward during mirror-up operation, the aperture ring turns clockwise.

The circumferential gear of the aperture ring drives the AC gear (3) via the FC gears (1) and (2). The AC gear (3) is provided with the FC slit (R) and FC ratchet. The FC slit, in combination with a photo coupler, detects the travel of the aperture ring. At the detection of a selected travel, the aperture magnet is energized.

The aperture control stopper, engaged with the magnet armature of aperture magnet, is pulled by a spring in the direction of releasing the magnet armature. At excitation of the aperture magnet, the magnet armature comes off and the aperture control stopper trips in the FC ratchet to stop the aperture ring.

At shutter charge after shutter travel, the aperture setting arm on the S. charge unit pushes the stopper setting lever to the right, so that the magnet armature is attracted by the aperture magnet and the aperture control stopper is disengaged from the FC ratchet. Then the aperture lever pushes the aperture ring in the direction of aperture opening to return it to the initial state.

During lens stop down, the delay gear is engaged with the anchor to keep a constant sto-down speed.



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4. Mount Base Unit

(1) Ring Plate Ass' y

With the ring holder base plate in between, the aperture interlock ring (on the mount side) and aperture ring (on the shutter side) are caulked coaxially containing rollers and supported at three points.
The aperture interlock ring is engaged with the aperture code ass' y via the aperture interlock gear (B) and pulled by a spring in the direction of aperture opening. The aperture ring, having a notch equivalent to the maximum travel and stopped by a projection on the ring holder base plate, is always pulled in the direction of aperture stop down by a spring force applied between the aperture ring spring cover and the apertue ring.
The pin on the grip side is pushed by the aperture lever to keep generally the aperture ring in the full-aperture position. During mirror-up operation, however, the gear on the aperture ring is engaged with the aperture control ass' y so that the position of the aperture ring is controlled. The pin on the cartridge side of the aperture ring is pushed by the aperture lever (L) during preview operation to control the aperture.
The open F. STOP signal lever, locked on the ring holder base plate, is pulled by the open F. STOP signal lever spring in the direction of aperture opening.

(2) Aperture Code Ass' y

The aperture code ass' y, engaged with the aperture interlock gear (B) on the ring plate ass' y, converts the position of the aperture interlock ring to an electrical signal.
The aperture code ass' y has the same structure as that of CONTAX RTS Ⅱ.

(3) Theta Setting Ass' y

The theta setting ass' y, interlocked with the theta setting pin on the lens unit, converts the theta compensation value to an electrical signal.

(4) Manual Mirror Up Ass' y

The manual mirror up ass' y incorporates the mirror up knob and lens lock button.

(5) Metering Change FPC Ass' y/Metering Mode Ass' y

The metering change FPC ass' y/metering mode ass' y converts the switching between average metering and spot metering to an electrical signal. It also turns on the preview switch when the preview button is pressed.

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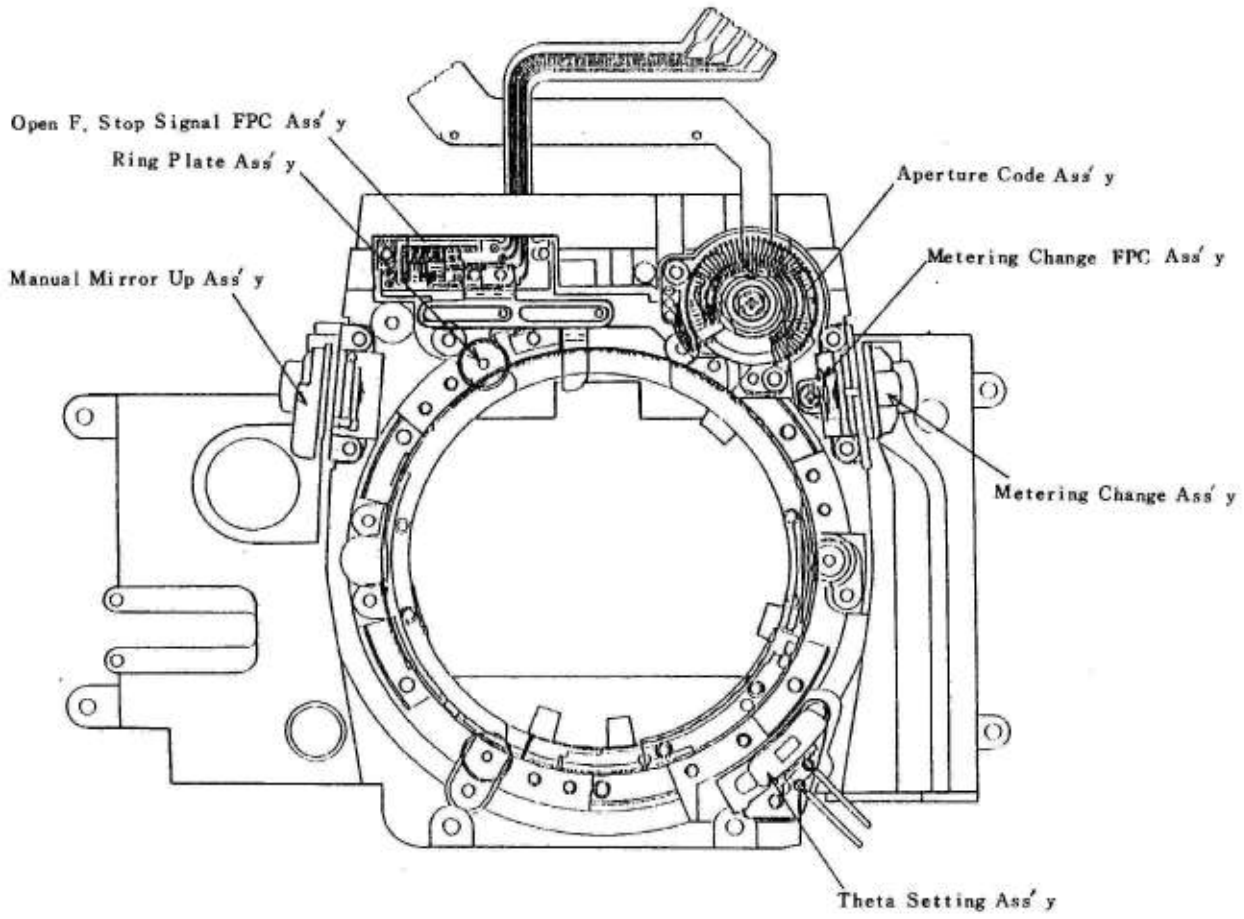
Open F. Stop Signal FPC Ass' y
Ring Plate Ass' y
Manual Mirror Up Ass' y
Aperture Code Ass' y
Metering Change FPC Ass' y
Metering Change Ass' y
Theta Setting Ass' y

5. Shutter

The shutter speed is controlled electronically with two magnets.

The S. charge lever on the S. charge unit pushes the setting lever on the shutter assembly to set the shutter. The release lever on the mirror up base plate ass' y releases the release lever on the shutter assembly.

To use the mechanical bulb function, install a mechanical cable release in the bulb-dedicated cable release socket and actuate the release. Then the mech. bulb slide plate is pushed to the right and pushes the mechanical bulb ever shaft engaged with the slot at the right end of the mech. bulb slide plate, so that the end of the mech. bulb lever presses the back iron lever on the shutter assembly to hold the second curtain.

At the same time, the mech. bulb lever pin turns on the mech. bulb switch to actuate the mirror-up operation and first curtain travel and waits until the mech. bulb switch is turned off.

Return the cable release, and the mech. bulb slide plate and mech. bulb lever will be restored to the initial state. Then the mech. bulb switch is turned off and normal shutter charge operation is performed to set the shutter.

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6. Winding Unit

(1) Revolving Limit

The sprocket shaft is provided with a revolving limit mechanism. When the sprocket is rotated by advancing the film, the spring is charged and the revolving limit lever trips in the revolving limit cam. At the same time, the release spring is also charged and the spring force releases the revolving limit mechanism immediately before next winding start when the solenoid plunger is activated to release the hook.

The revolving limit switch interlocked with the revolving limit lever turns off power to the winding motor and advances the counter.

This operation is performed by rotation of the sprocket caused by film advance. Therefore, the revolving limit switch does not operate when no film is loaded or auto loading is not performed correctly. That is, this mechanism facilitates checking for the presence of a film and its advance.

(2) Encoder

The motion of the sprocket can be checked by the photo-interrupter and the 16-tooth slit plate, which turns three times when the sprocket turns one time. The output of the photo-interrupter is used to perform reverse operation of the counter during rewinding, control the rewinding speed and a part of the film leader remains out of the cassette.

(3) Solenoid Plunger

The solenoid plunger, controlled by electric signals, releases the sprocket from the revolving limit mechanism and recovers the winding mechanism from rewinding state.

(4) Winding Motor

The coreless motor realizes high-speed, silent winding.

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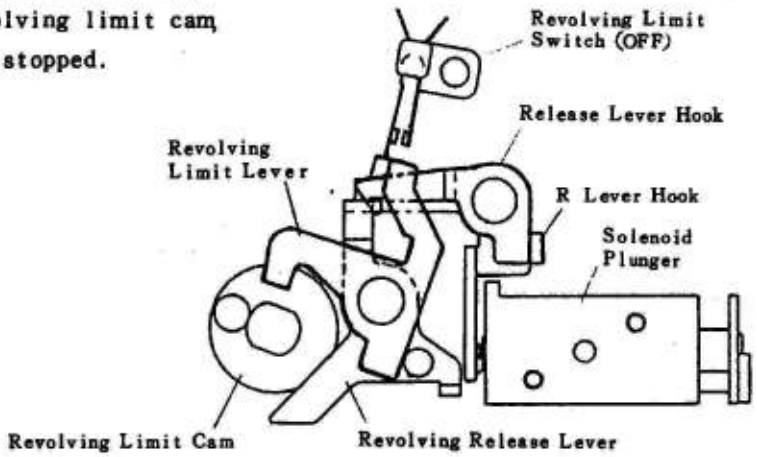
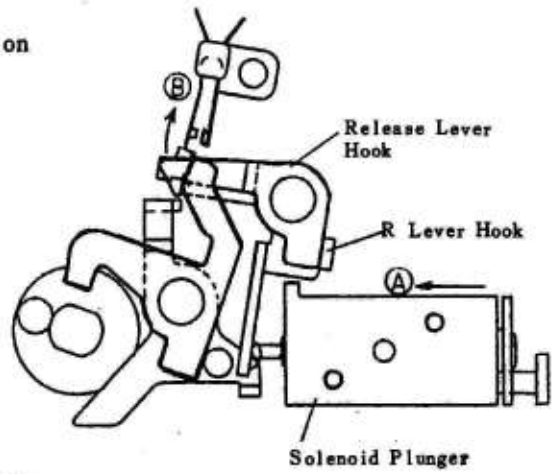
(5) Winding Operation

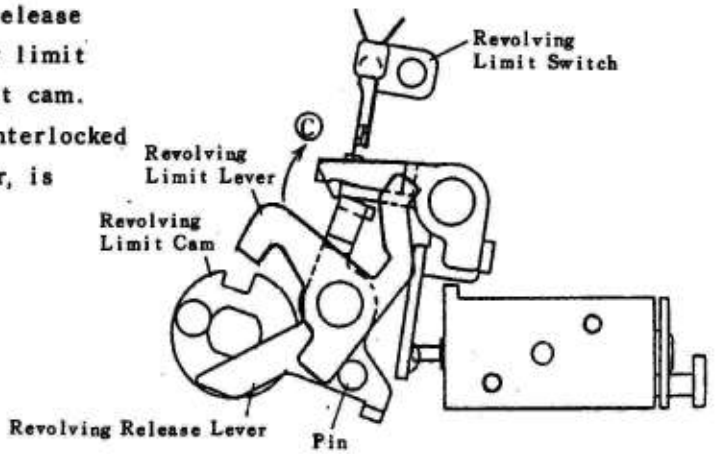
① Initial state before winding
The revolving limit lever, having tripped in the revolving limit cam, keeps the sprocket stopped.



② The solenoid plunger, when energized, moves in the idrection of the arrow Ⓐ to turn the R lever hook and release lever hook in the direction of the arrow Ⓑ.



③ When the release lever hook is dis-engaged, the revolving release lever is turned by a spring in the direction of the arrow Ⓒ. At this point, the pin caulked on the revolving release lever disengages the revolving limit lever from the revolving limit cam. The revolving limit switch, interlocked with the revolving limit lever, is turned on.



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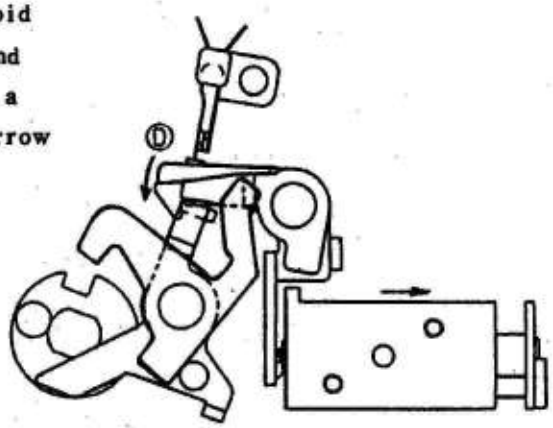
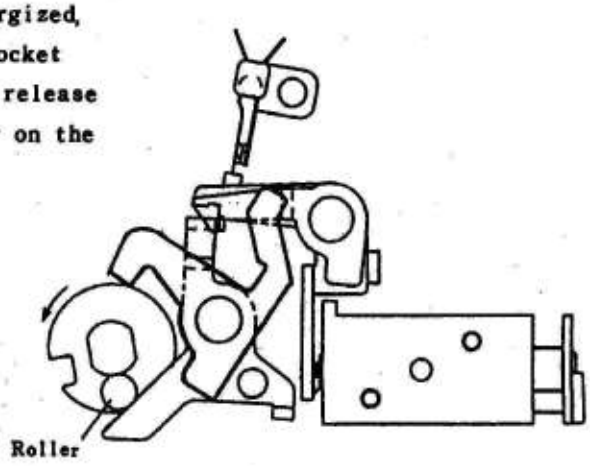
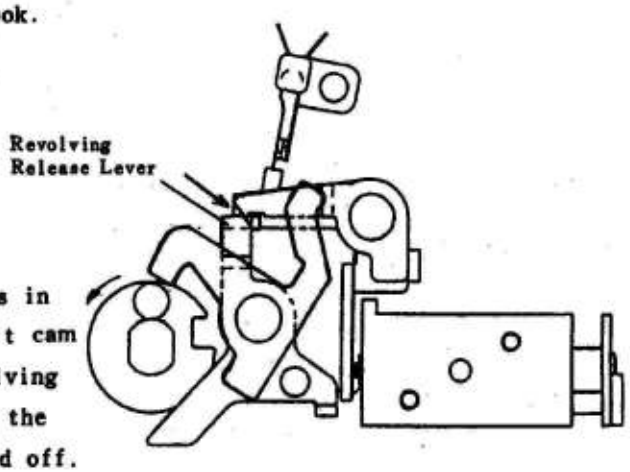
④ The revolving limit switch, when turned on, shuts off power to the solenoid plunger. Then the R lever hook and release lever hook are turned by a spring in the direction of the arrow Ⓓ.



⑤ When the winding motor is energized, the film is wound and the sprocket is driven. Then the revolving release lever is charged by the roller on the sprocket shaft.



⑥ The charged revolving release lever is held by the release lever hook.



⑦ The revolving limit lever trips in the notch of the revolving limit cam to stop the sprocket. The revolving limit switch, interlocked with the revolving limit lever, is turned off. This "OFF" signal shuts off power to the winding motor.

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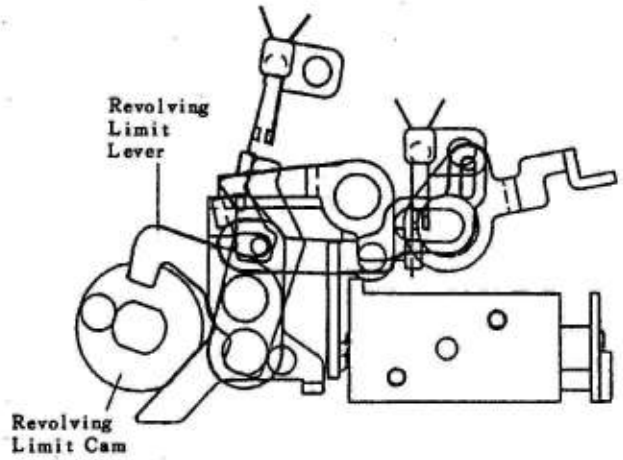
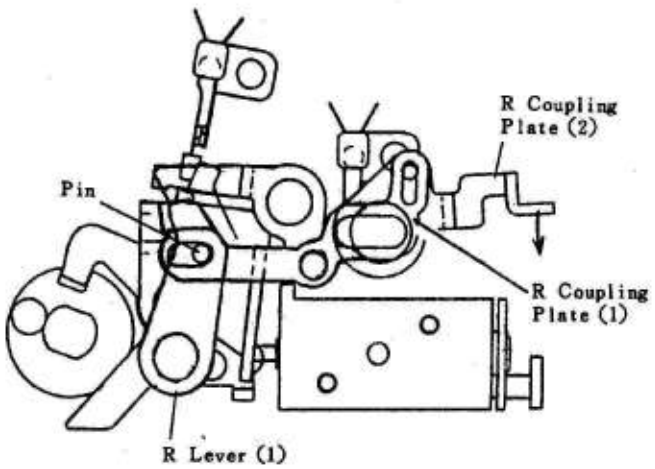
(6) Rewinding Operation

① Initial state before midway rewinding

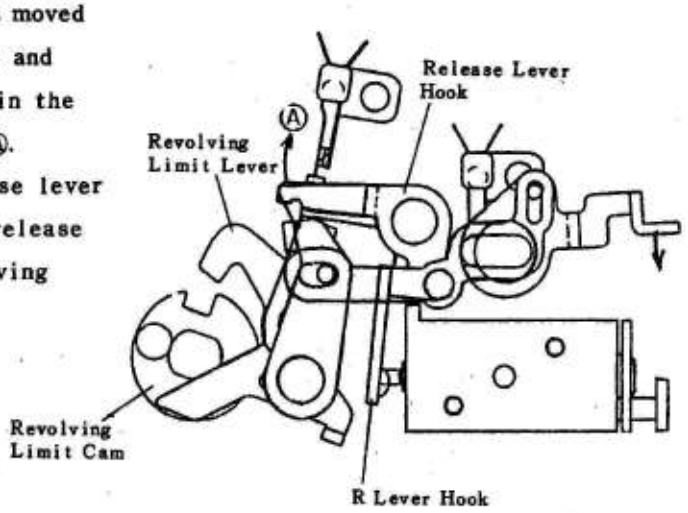
The revolving limit lever, having tripped in the revolving limit cam, keeps the sprocket stopped. In the case other than midway rewinding, the revolving limit lever is disengaged from the revolving limit cam and the cam is in a random position.



② When the rewind lever is moved, the R coupling plate (2), R coupling plate (1) and R lever move and the R lever pushes up the sloped surface of the R lever hook. Also the pin caulked on the R lever starts disengaging the revolving limit lever from the cam.



③ When the rewind lever is moved further, the R lever hook and release lever hook turn in the direction of the arrow Ⓐ. Then the revolving release lever is disengaged from the release lever hook and the revolving limit lever is from the revolving limit cam.



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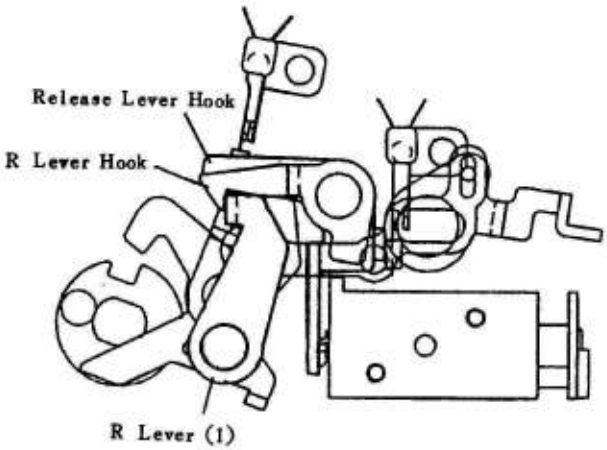
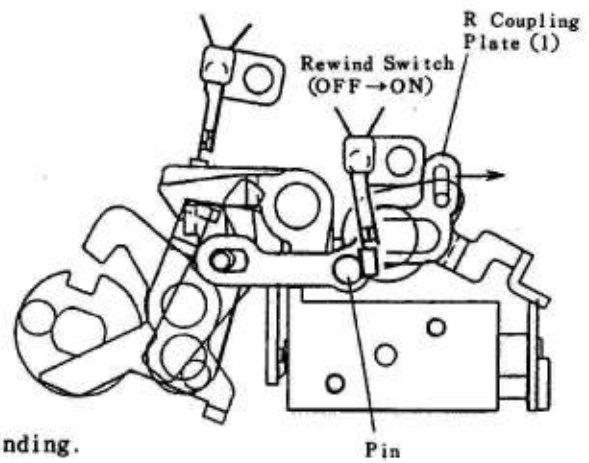
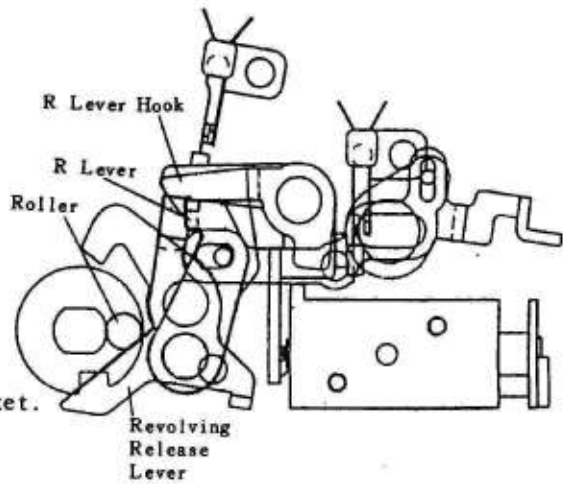
④ When the rewind lever is moved further, the R lever is caught by the R lever hook. At the same time, the clutch lever (see page A–11) is moved to disengage the clutch between the motor and spool.



⑤ When the rewind lever is moved further, the spring between the R lever and the R coupling plate (1) is elongated and the R coupling plate (1) moves to the right. Then the pin caulked on the R coupling plate (1) turns on the rewind switch. The "ON" signal from the rewind switch turns on power to the rewind motor to start winding.



⑥ The rewind lever, when released from your hand, returns to the initial position by the effect of the spring.
However, rewinding state is kept by the R lever caught by the R lever hook. As rewinding has been started, the sprocket is driven by the moving film and the revolving release lever is charged by the roller on the sprocket.



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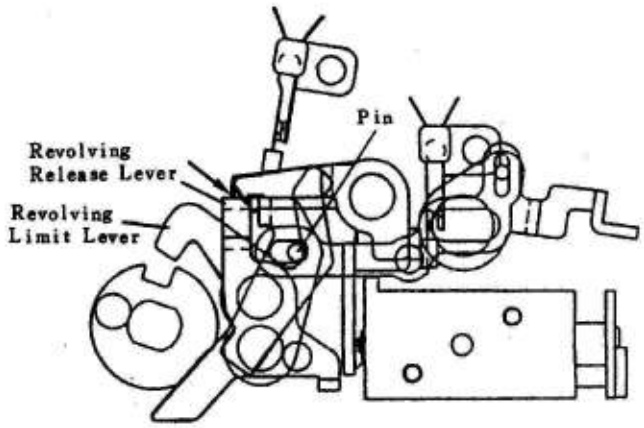
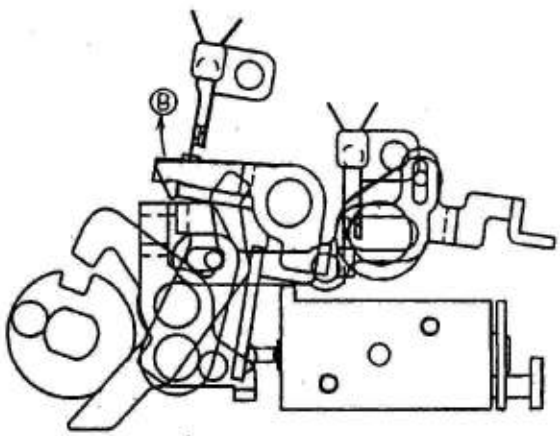
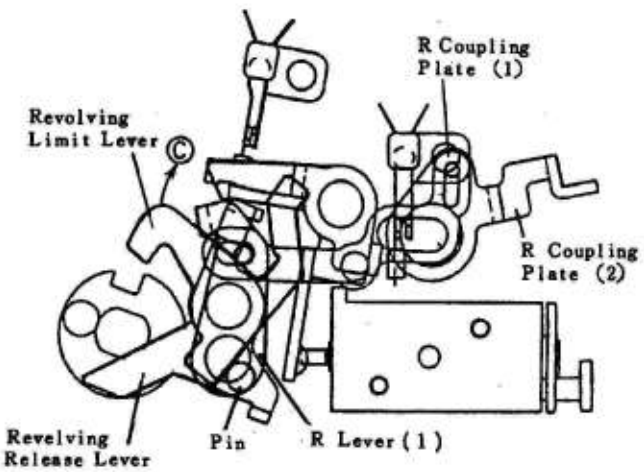
⑦ The revolving release lever is completely charged and caught by the revolving release lever hook. At this point, the revolving limit lever, held by the pin caulked on the R lever, does not trip in the revolving limit cam.
Under these conditions, rewinding is continued until the film comes off the sprocket. During this operation, the rotation of the sprocket is checked by the encoder connected to the sprocket and gears.



⑧ After completion of rewinding and film replacement, the system returns from rewind mode to winding mode at start of auto loading. When the solenoid plunger is activated, it pushes the R lever hook and then the R lever hook and release lever hook turns in the direction of the arrow Ⓑ.



⑨ When the release lever hook is disengaged. the pin caulked on the revolving release lever pushes the revolving limit lever to turn it in the direction of the arrow Ⓒ. The R lever hook is disengaged and the R lever (1), R coupling plate (1) and the R coupling plate (2) return.



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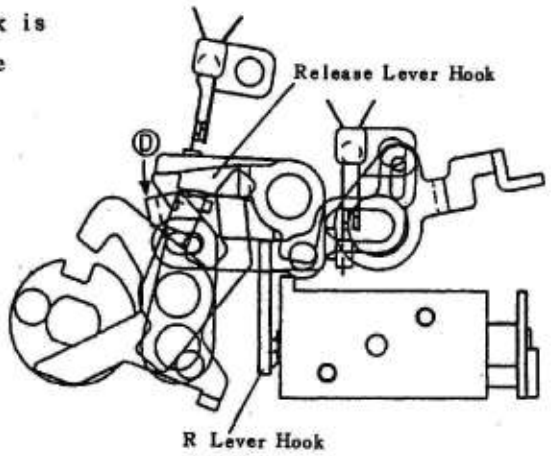
⑩ When power to the solenoid plunger is shut off, the R lever hook and release lever hook is turned by the spring in the direction of the arrow Ⓓ.



1. Electronic Circuit

The electronic circuit consists of the system control CPU, CPU for controlling mechanical operations acording to the command by the system control CPU, spot metering IC, center-weighted average metering IC, IC for pre-flash TTL spot metering and direct TTL flash metering, data memory EEPROM, power and shutter control ICs, motor drive IC, and LCD panel and back light EL (Electro Luminescence). Commands and data are exchanged via a 4-bit data bus between the CPUs and between the system control CPU and each control IC or by serial transmission between the system control CPU and the EEPROM. The measured data by the metering IC and sampled every 1.25 milliseconds and averaged to optimize metering. Sixteen seconds after power-on, the light metering circuit is automatically turned off for power saving. Therefore, the user need not be nervous about turning off the main switch. For each operation, however, the metering-on time of 16 seconds is renewed when, during power-on of the metering circuit, settings are changed by operating the preset aperture ring, shutter speed setting dial, exposure compensation dial or ISO dial, or preview operation or pre-flash spot metering is performed. Also the AE lock value and the measured value by pre-flash metering are stored in EEPROM so that the data are kept even after power-off of the metering circuit.

Measured values and all other data, including the analog signals for pre-flash metering and battery check level, are adjusted by the digital adjusting system, without using any variable resistance for adjustment.

And the adjusted data are stored in the EEPROM. Also the adjusted data are processed by the CPU for use as control data to assure a high-precision and reliable system.

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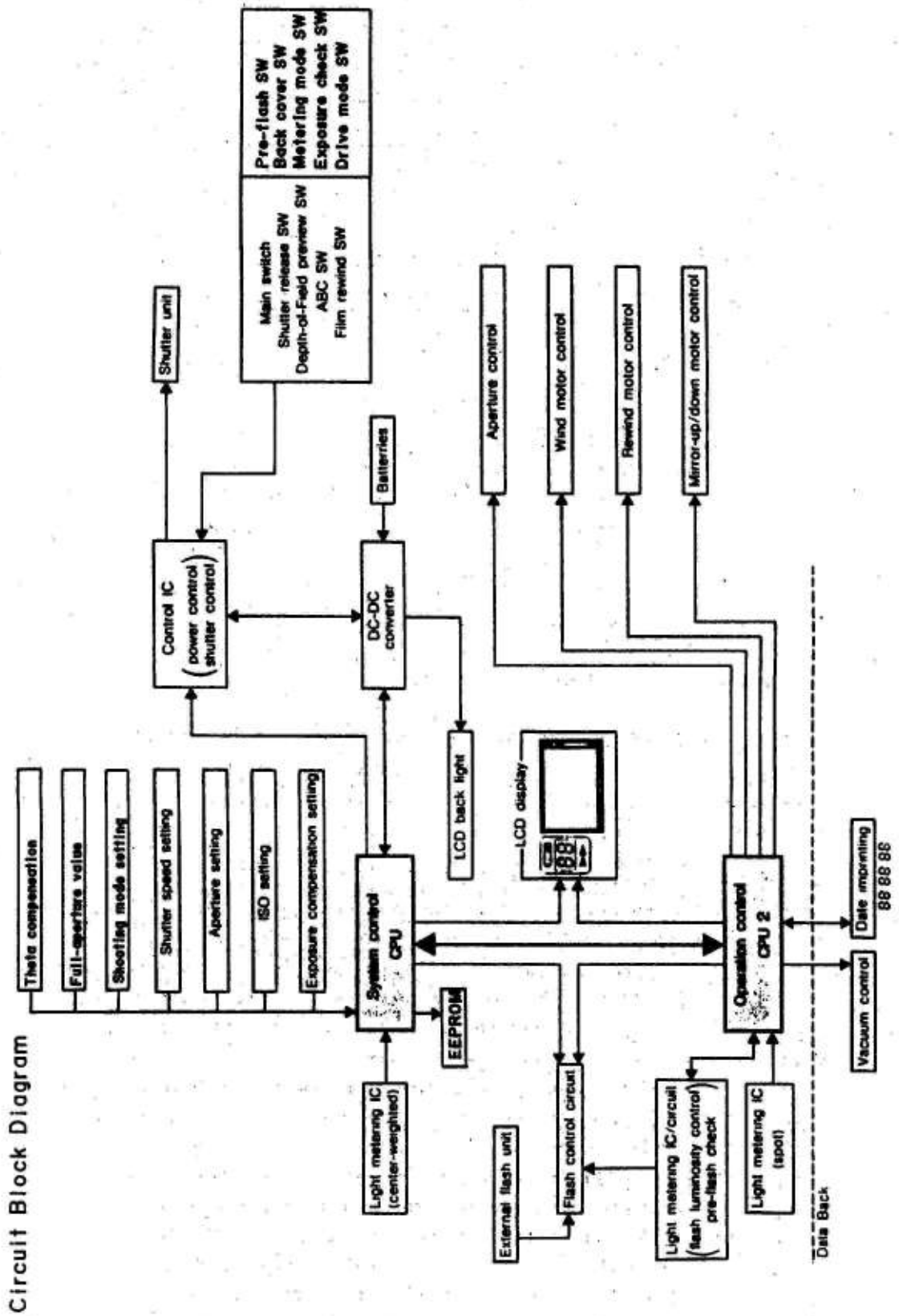

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Switch Functions inside the Camera

No.	Switch name	Function
S1	Mirror-up switch	Turns ON at completion of mirror-up, Mirror-up motor is stopped at detection of ON
S2	Charge switch (timing switch)	Turns ON during charge (mirror-down) and OFF at completion of charge. Completion of charge is detected at ON→OFF of this switch.
S3	Aperture open switch	Thrns On when automatic aperture stop down lever is in open position. Detects open position of aperture at power on. Detects completion of aperture return in aperture control at preview or flash metering.
S4	Aperture close switch	Turns ON when automatic aperture stop down lever is in fully closed position. Detects completion of aperture stop down in aperture control at preview or flash metering.
S5	Singl-revolution switch	ON when singl-revolution limit lever is in lock position, and turns OFF when limit lever is relessed by operation of single-revolution plunger. Detects completion of release which takes place immediately before winding.

Aperture open switch/Aperture close switch

(See the drawing on the next page.)

* The aperture open switch/aperture close switch contact is caulked to the cam gear. The relative position of the contact to the pattern position or the cam base plate determines whether it is the aperture open switch or the aperture close switch.

① The cam gear is on stand-by at Ⓑ and Ⓒ.

② With the preview switch turning on, the rewinding motor rotates clockwise, then the cam gear is rotated via a gear train in the direciton of the arrow Ⓔ. The contact rotates together with the cam gear, moving the swing arm in the direction of the arrow Ⓕ. The aperture lever, pushed by the swing arm, rotates in the clockwise direction of the aperture ring, thus causing the aperture blades of the lens to close in (See Fig. 144).

③ At the fully closed position, the aperture close switch (S4) turns on, the CPU2 detects the motor stop signal, and the rewinding motor stops. Ⓒ→Ⓓ

④ As the preview switch turns off, the rewinding motor rotates is the clockwise direction. This rotates the cam gear in the direction of the arrow Ⓔ via a gear train, and the cam roller enters the bottom (Ⓐ position) on the cam surface of the cam gear.
Simultaneously with this, S3 turns on, the CPU2 detects the motor stop signal, and the rewinding motor stops. With the cam roller in position Ⓐ, the aperture is fully open.

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System Outline

The principal IC's used in the camera control circuit are as follows:

CPU1	: System control
CPU2	: Mechanism control, flash control
C-IC	: Power control, port extension, shutter control
Metering IC2	: Center-weighted average metering
Metering IC2	: Spot metering
Flash light control IC	: Flash light control
EEPROM	: Storage of adjusted values and camera status data
DC-DC Converter	: Stabilized voltage output, EL drive voltage output

CPU1 and CPU2 are one-chip microcomputers of the same type with built-in AD converter, LCD driver and serial interface. EEPROM is an electrically erasable programmable read only memory.

Power supply

Supply voltages are VCC, which is battery voltage stabilized by a 3-terminal regulator (output: 5.2V), and VDD, which is DC-DC converter output. VDD will be 4.6 to 5.2V if the battery voltage is 3.5V or over.
As long as batteries are in, VCC is present irrespective of power on or off of the camera. VDD, which is a voltage present only when the power of the camera is ON, is controlled by the C-IC (refer to section on C-IC).
Since VDD and VCC are connected via a diode, VDD=VCC while VDD is being output (the camera power is ON).
The IC's operating on VCC are CPU1 and C-IC while other IC's run on VDD.

System operation

CPU1 performs the system control of the camera. CPU1 controls the exposure mode, drive mode, metering mode, pre-flash function, ABC function and other functions of the system as a whole, and performs calculations for the respective modes and functions.
Center-weighted average metering data are read by CPU1, and spot metering data by CPU2. The spot metering data are sent from CPU2 to CPU1.
Various switch settings and dial information are read by CPU1 and C-IC. The C-IC sends the input information to CPU1 in response to the command from CPU1.
The ISO information and preset aperture stop down value are subjected to resistance division, and the divided voltages are taken in by CPU1 through AD conversion.
Based on the information thus obtained, CPU1 performs all the processings of metering calculations, shutter control and selection of mechanism operations.
CPU2 performs a series of shutter sequence control, such as preview action, RTV control relative to 5 frames per second, mirror-up and aperture control, as well as issuance of data back imprinting commands.

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Flash control

Flash light control is carried out by the flash light control IC under the control of CPU2, "Over/Normal/Under" in this control is detected by CPU2, and the analysis result sent to CPU1, CPU1, in turn, processings a calculation on this value and display its result.
Light emission in pre-flash is accomplished with CPU1 controlling the triac. As for the flash at shooting, a first curtain synch. flash is caused by the X-synch. hot-shoe within the shutter unit, and a second curtain synch. flash by the AX signal of CPU1. X-synch. and AX signal are both output at the moment of shooting. Selection between the second curtain synch. or the first curtain synch. is made by the flash unit. Accordingly, the second curtain synchronized flash is only possible when the dedicated flash unit is used.

Display

The viewfinder display consists of a transparent LC (Liquid Crystal) panel and EL back light. The LCD is driven by the LCD driver built into the CPU. LCD drive is based on 3-time-division 1/3 duty. The shutter time LCD is controlled by CPU2, and the aperture LCD (lower part of viewfinder) by CPU1.

The EL is driven by a. c. high voltage. The a. c. high voltage is generated by the DC-DC converter with clock provided by CPU1.
The external LCD display is a reflection-type LCD connected in parallel with the film counter of the viewfinder display.

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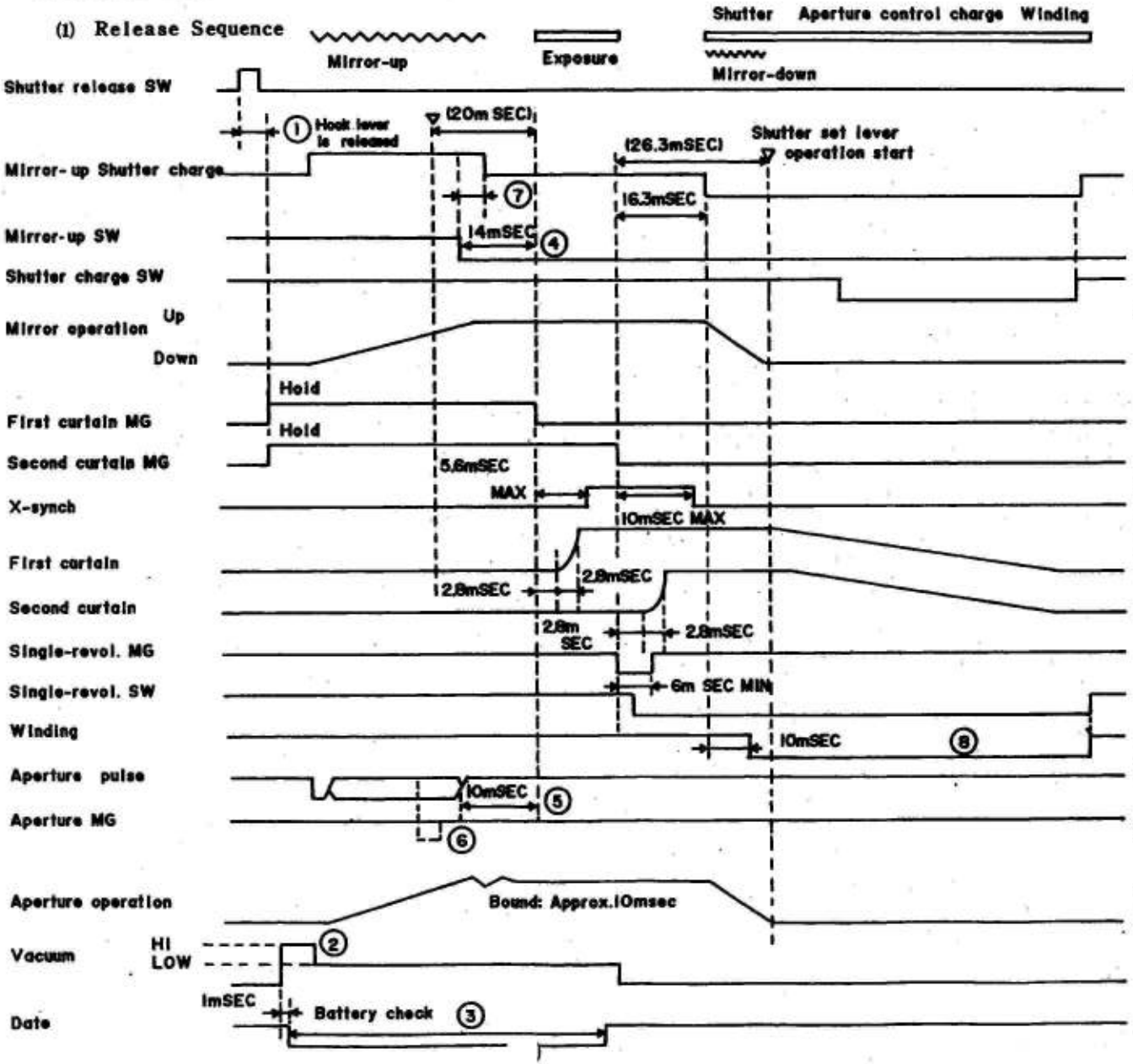
Sequence Time Charts

(1) Release Sequence



① Switch detection, metering calculation, approx. 5 msec

② Vacuum H 1 time: changes with supply voltage.
No vacuum operation without film.

③ Date imprinting time: changes according to ISO value

ISO	6400~200	(200)~25	(25)~6
msec	30	60	120

NO output, as a rule, of imprint signal without film.

④ 14 msec after mirror-up switch ON, or

⑤ 10 msec after output of specified aperture pulse count, First curtain magnet OFF at whichever later

⑥ Aperture operation controlled by aperture magnet in TV mode

⑦ Supply voltage 5.2 V or above 6msec
5.2 V or below 11 msec

⑧ Left chart represents case for drive mode CH.
At CL, winding takes place after completion of charge.

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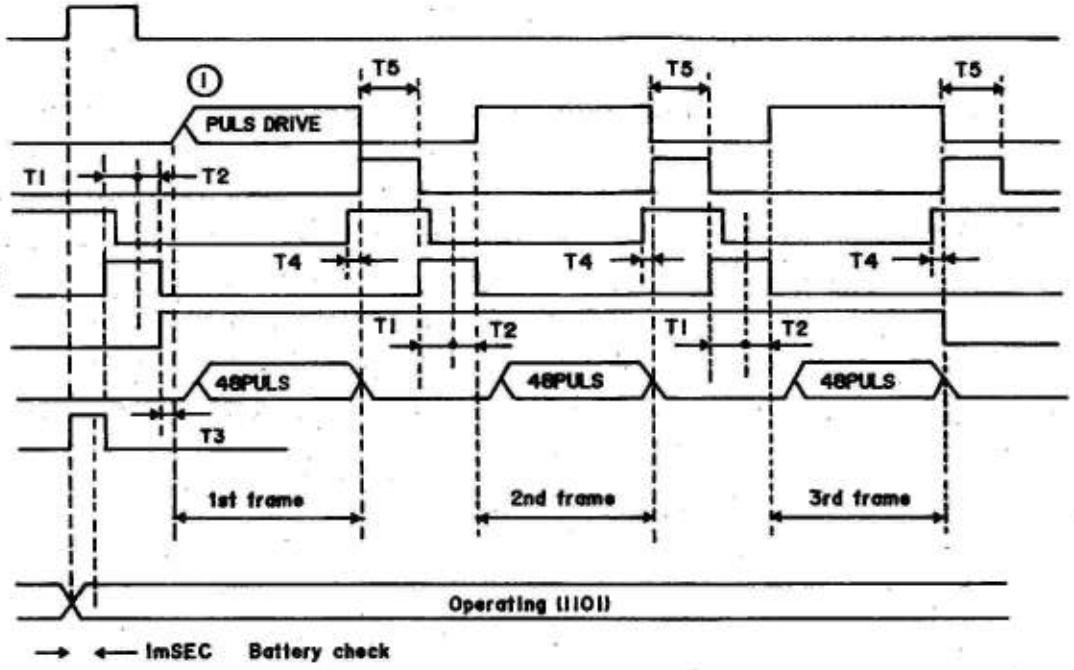
(2) Auto Loading Control



T1: Single-revol.MG OFF delay 5 msec
T2 Single-revol. SW LOW decision 1 msec
T3: Sprocket SW photointerupter LED ON delay 100 μsec
T4: Single-revol. SW (LOW→) HI decision 1 msec
T5: Winding motor brake time 5 msec

① : Supply voltage
Below 6.5V : DC drive
Above 6.5V : Pulse drive up to 425 msec of drive time, the DC drive up to 800 msec of operation limit time

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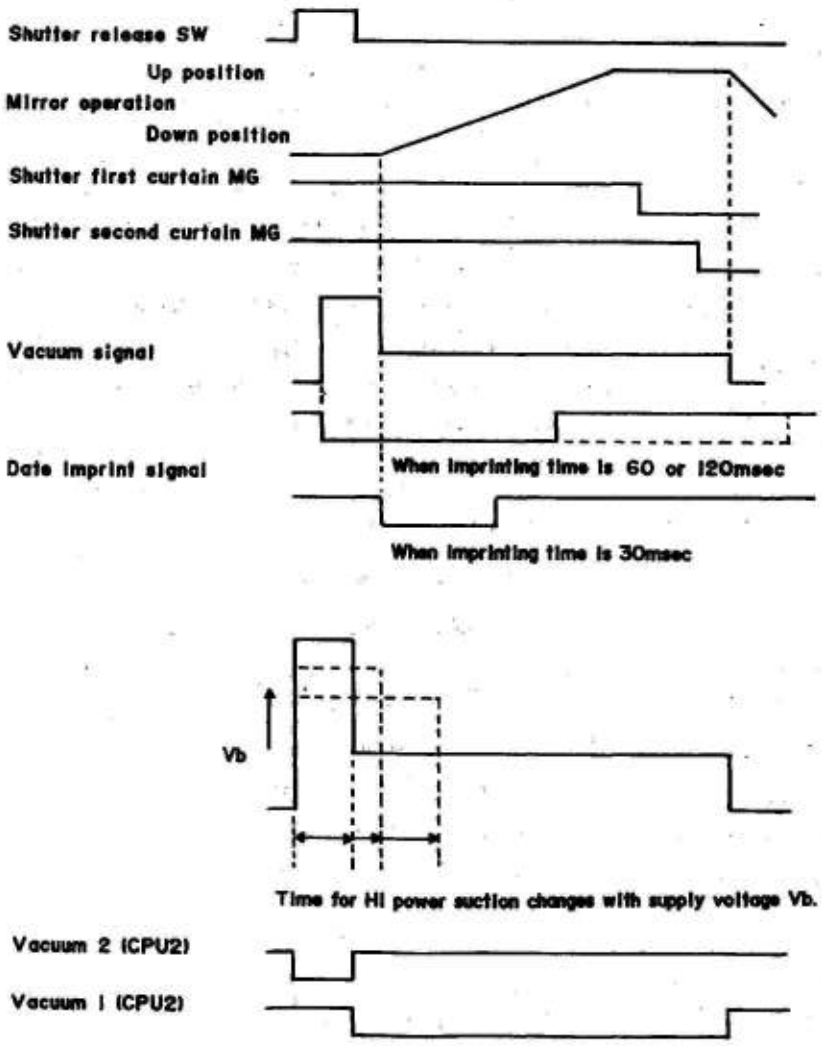
(8) Vacuum Operation, Date Imprinting



Date Imprinting

- Normally, during drive of S, LC, CH, S2 or S10, date signal turns ON before mirror-up for time corresponding to ISO as shown below. When imprinting time of 30 msec has been selected however, date signal turns ON after vacuum has switched from HI to LOW.
- When drive mode is multiple, date imprinting is done only for 1st release of multiple exposure (no repeated imprinting).

ISO	6400~200	(200)~25	(25)~6
msec	30	60	120

Vacuum

This film suction control performs 2-stage control of suction plunger force.

Initially HI power suction time is determined according to supply voltage Vb read at battery check before operation. Then the voltage is switched to voltage necessary to keep this suction, and suction turns OFF after shutter second curtain has completed its travel.

* As a rule, vacuum operation and date imprinting are not performed without film.

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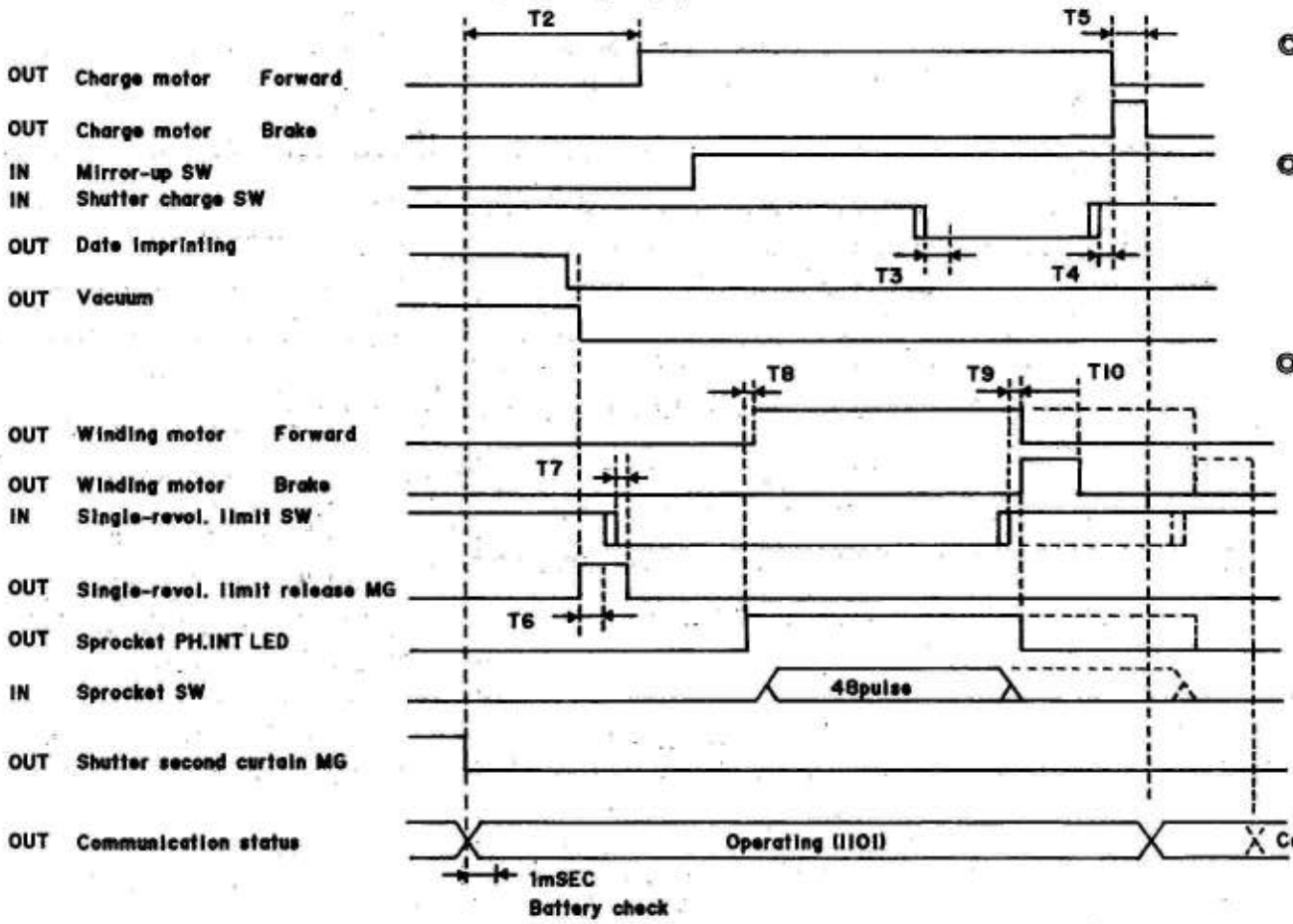
(4) Winding Control (CH mode (high-speed))



◎ Received command
o Winding (CH) 1110

◎ Status
Command wait status is returned on completion of both and shutter charge (mirror-down) and winding.

◎ Operation limit (Error detection)
Both shutter charge and winding must complete within 800 msec from start of charge operation.

T2: Shutter regulation ensuring 16.3 msec
T3: SW LOW decision 5 msec
T4: HI decision 1 msec
T5: Charge motor brake time 5 msec

T 6:	Single-revol. MG	OFF delay	5 msec
T 7:	Single-revol. SW	LOW decision	1 msec
T 8:		HI decision	1 msec
T 9:	Photointerrupter LED	response	100 μsec
T10:	Winding brake time 5 msec		

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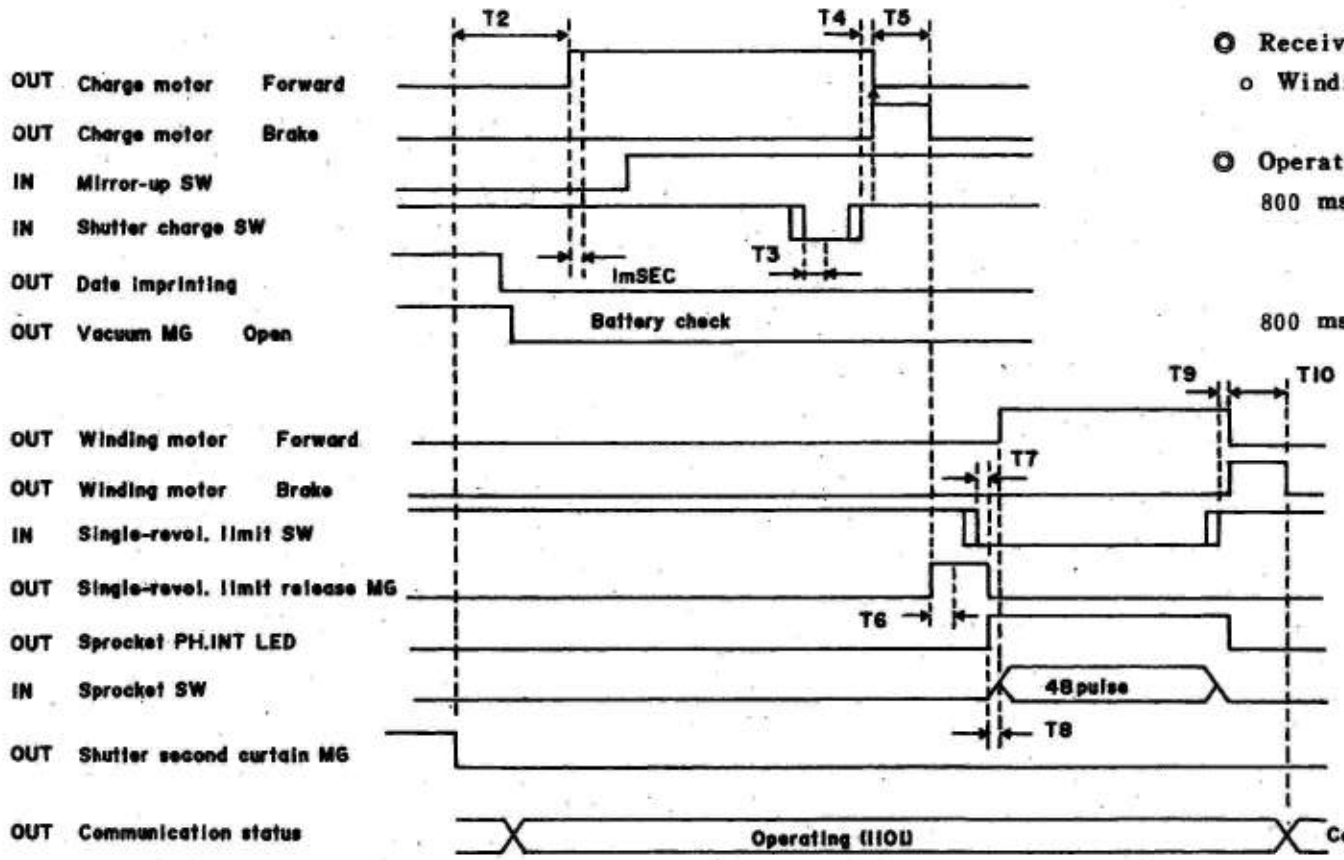
(5) Winding Control (CL mode (low-speed))



O Received command

o Winding (CH) 1101

O Operation limit

800 msec: from start of charge motor forward run to charge switch HI→LOW

800 msec: from start of winding to single-revol. switch LOW→HI

T2: Shutter regulation ensuring 16.3 msec
T3: SW LOW decision 5 msec
T4: HI decision 1 msec
T5: Charge motor brake time 5 msec

T 6: Single-revol. MG OFF delay 5 msec
T 7: Single-revol. SW LOW decision 5 msec
T 8: decision 1 msec
T 9: Photointerrupter LED response 100 μsec
T10: Winding brake time 5 msec

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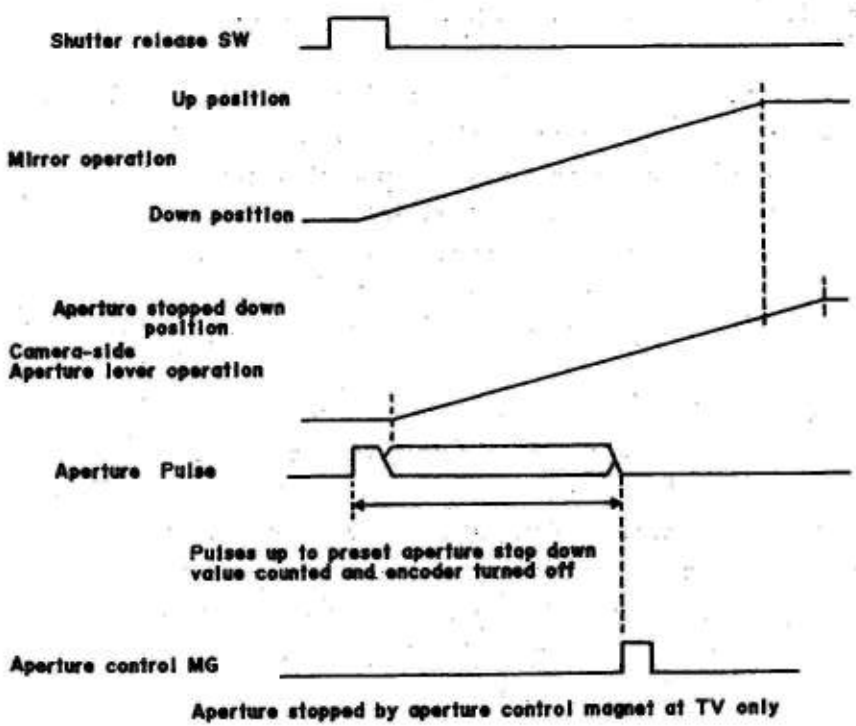
(6) Aperture Control


Shutter release SW
Up position
Mirror operation
Down position
Aperture stopped down position
Camera-side Aperture lever operation
Aperture Pulse
Pulses up to preset aperture stop down value counted and encoder turned off
Aperture control MG
Aperture stopped by aperture control magnet at TV only

Aperture lever operates almost simultaneously with mirror-up, and aperture pulse is output from aperture encoder. Control is performed by counting this pulse.

In AV, M or B mode

Pulses based on aperture stop down value set by aperture ring of lens are counted, and encoder is turned off upon confirming that aperture has stopped down the settings. Aperture magnet is not controlled.

8 pulses/1 stage (per aperture)

In TV mode

Pulse count up to operation of aperture magnet is determined from the aperture pulse count of aperture stop down value as determined by metering result and the operation delay pulse count of aperture control magnet measured by adjusting device beforehand. According to this value, amount of aperture operation is counted, magnet is operated and aperture is stopped at regulated position.

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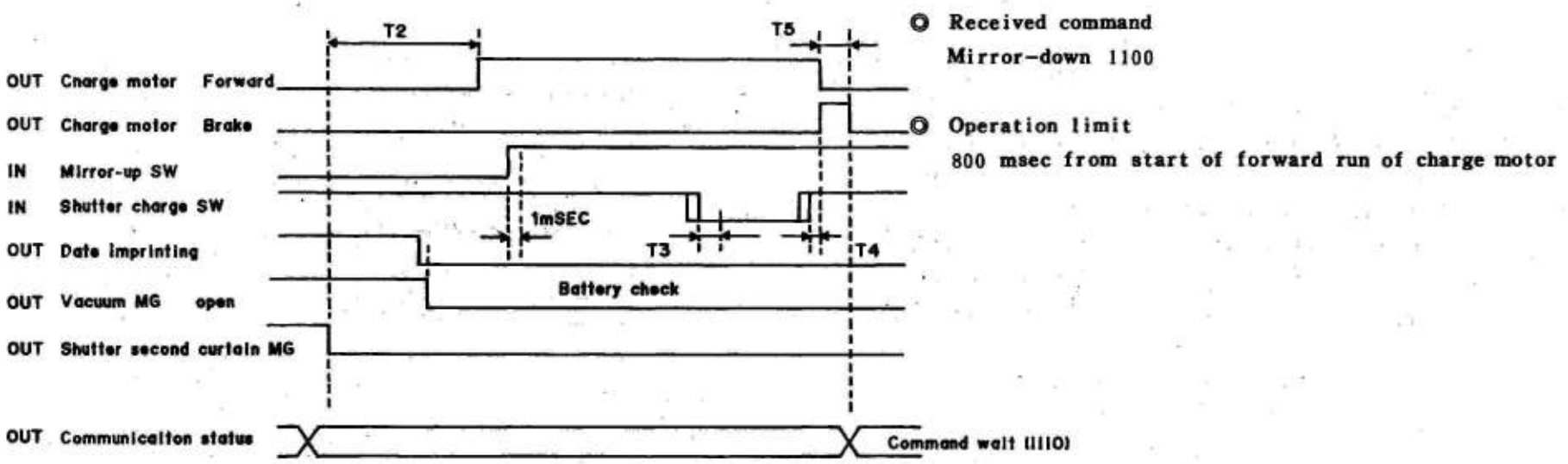
(7) Mirror-down Control

(mirror-down & shutter charge operasion only (multiple))



T2: Shutter regulation ensuring 16.3 msec

T3: SW LOW decision 5 msec

T4: HI decision 1 msec

T5: Charge motor brake time 5 msec

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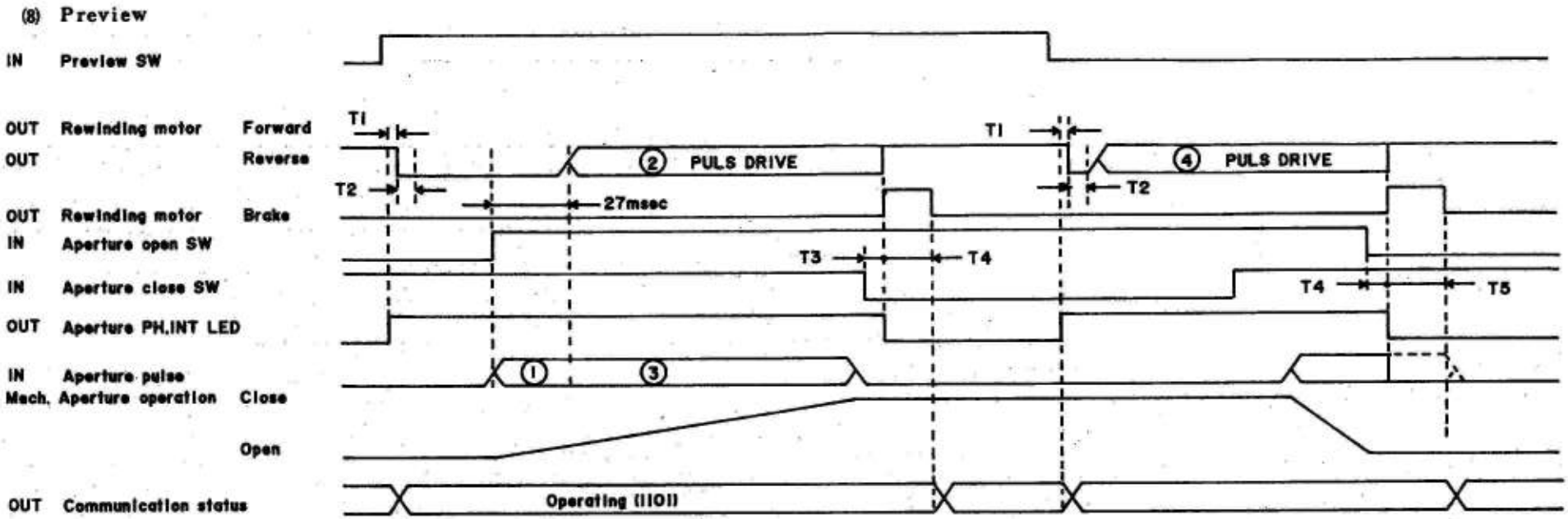
(8) Preview



T1: Aperture photointerrupter LED response time delay 10 μsec
T2: Battery check timing 1 msec
T3: Aperture stop down SW On decision 1 msec
T4: Rewinding motor brake time 50 msec

Preview close operation

① Aperture pulse count is output within 27 msec from aperture open switch OFF.
② Pulse drive ON and OFF (duty) times are determined according to above aperture pulse count.

Preview open operation

③ Pulse drive ON and OFF times (duty) are calculated, using value determined ② of preview close operation.
(ON time: about 1/4)
Also, output pulse (③) is detected during pulse drive, and speed is controlled.

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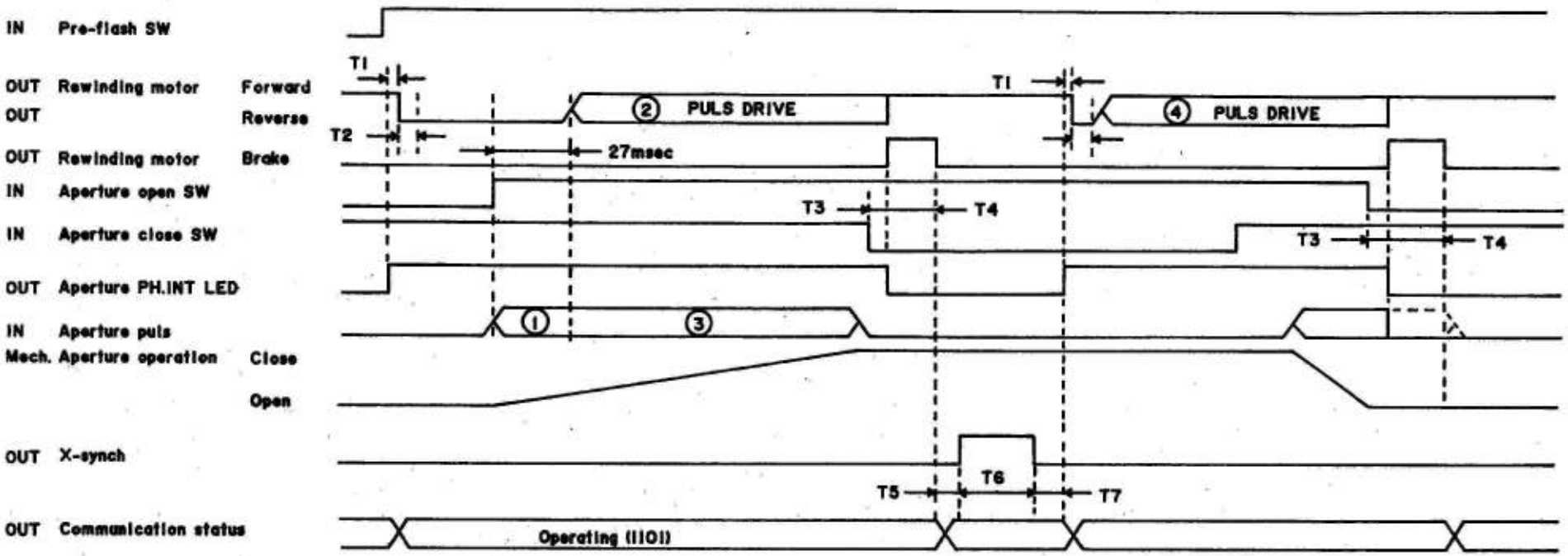
(9) Pre-flash



T1: Aperture photointerrupter LED response time delay 100 µsec
T2: Battery check timing 1 msec
T3: Aperture stop down SW ON decision 1 msec
T4: Rewinding motor brake time 50 msec
T5: Flash control start command communication 2.5 msec
T6: Shutter time (max. 30 msec)
T7: Flash metering data communication, Preview Open Communication. 2 msec

Preview close operation

① Aperture pulse count is output within 27 msec from aperture open switch OFF.

② Pulse drive ON and OFF (duty) times are determined according to above aperture pulse count.

Preview open operation

④ Pulse drive ON and OFF times (duty) are calculated, using value determined in 2 of preview close operation.
(ON time: about 1/4)
Also, output pulse (③) is detected during pulse drive, and speed is controlled.

Flash metering data during pre-flash SW ON are stored and flash metering display is made. Flash control is performed accordingly at release.

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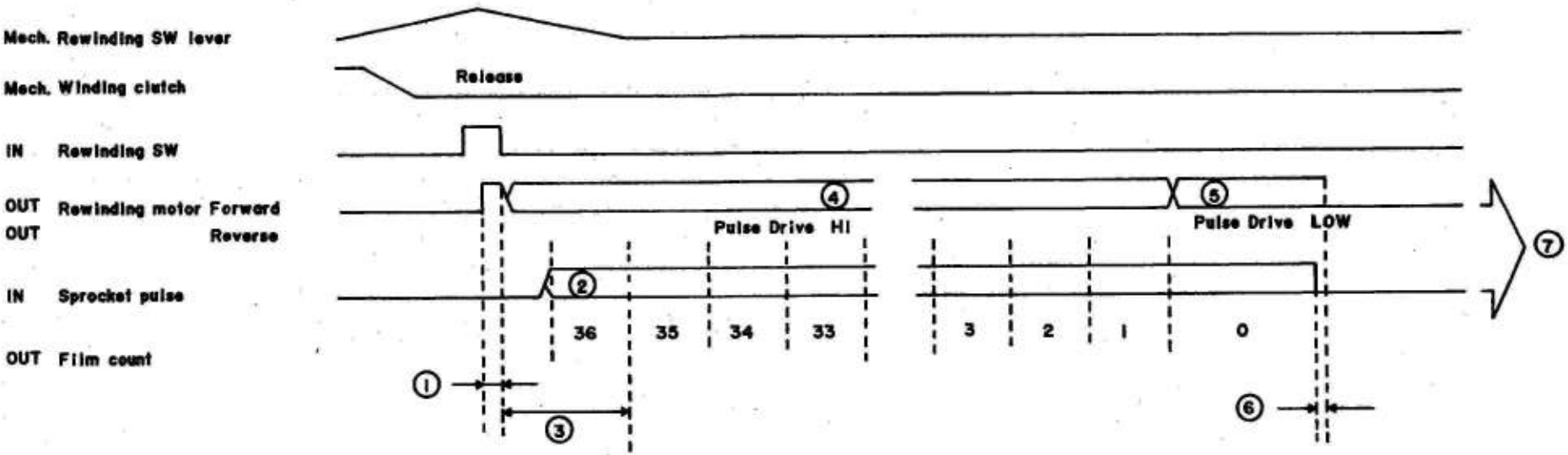
⑩ Rewinding



① Battery check is made 1 msec after motor ON.

② 48 pulses are for one frame.

③ For 3 seconds from drive start of pulse drive HI, pulse output for one frame(48 pulses) is waited to take up film winding slack.

④ ⑤ Drive speed: pulse drive HI > pulse drive LOW
(Pulse drive HI is nearly of DC drive.)

⑥ Without pulse output for 50 msec, rewinding ends as Film End.

⑦ Preview Close→Open operation causes return of epicyclic gear.
(Refer to section on preview.)

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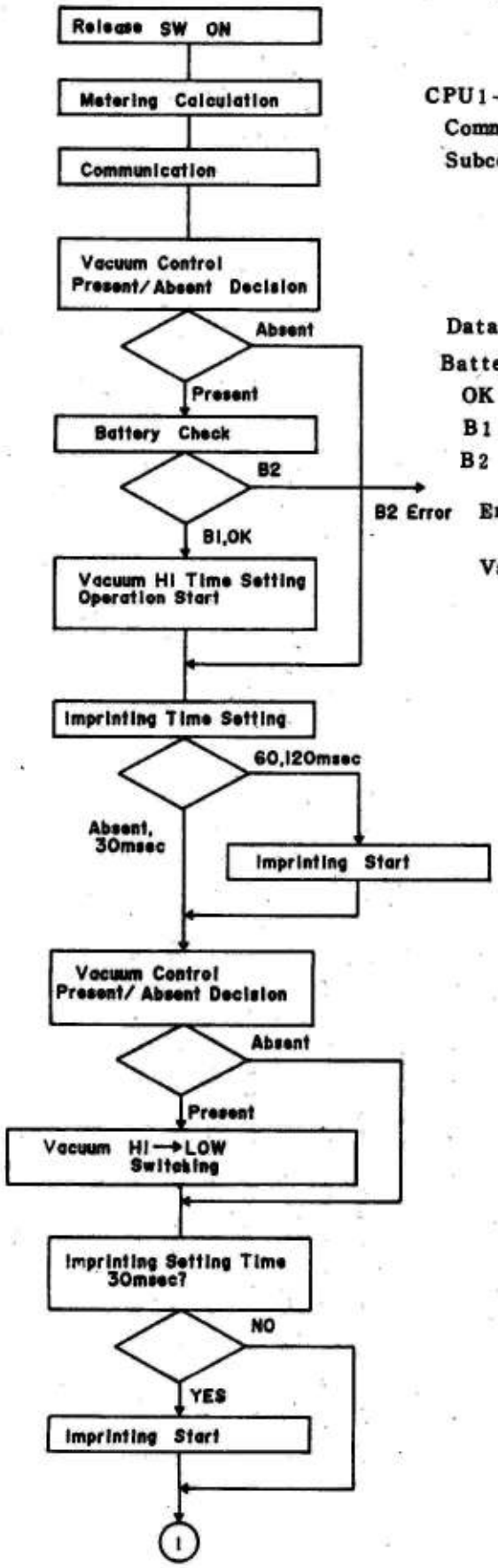
Circuit Control

(1) Release Sequence Flowchart CH Mode



CPU1→CPU2

Command : Mirror-up

Subcommand: Aperture control Present/Absent

Present: TV

Absent : B, M, AV

Vacuum Present/Absent

Date imprinting Absent/30/60/120 msec

Data : Aperture pulse count

Battery check

OK : 4.5V and above

B1 : 4.5 – 4.2V

B2 : 4.2V and below

B2 Error Error processing: Operation halt, Display: Battery mark flashing

Vacuum: HI time changes with supply voltage Vb.

Vacuum operation is not done without film.

Date imprinting time: Changes with ISO value.

None without film

ISO	6400~200	(200)~25	(25)~6
msec	30	60	120

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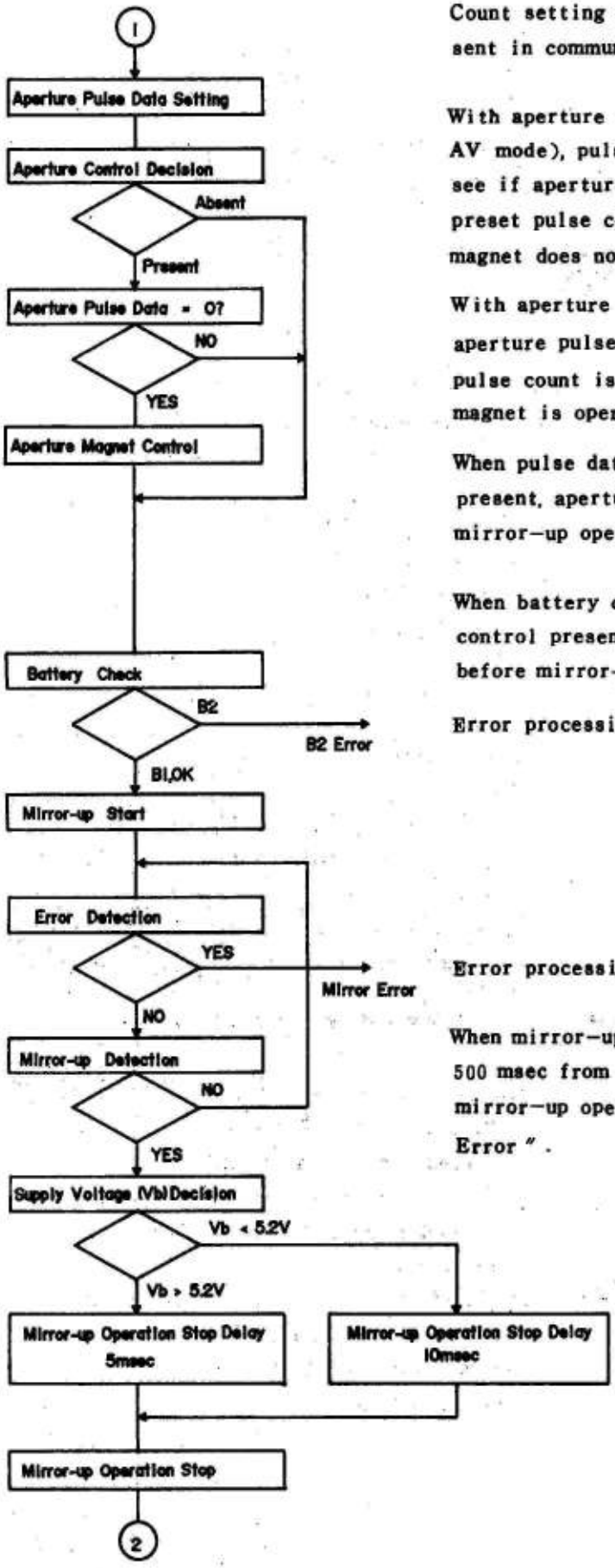

Count setting for pulse counting based on sent in communication

With aperture control absent (in B, M or AV mode), pulse counting only is done to see if aperture has operated according to preset pulse count, and aperture control magnet does not operate.

With aperture control present (in TV mode), aperture pulse is counted, and when preset pulse count is reached, aperture control magnet is operated to stop aperture.

When pulse data is 0 with aperture control present, aperture magnet is operated before mirror-up operation.

When battery check is done with vacuum control present, there in no battery check before mirror-up start.

Error processing: Operation halt

Error processing: Operation halt

When mirror-up can not be detected within 500 msec from start of mirror-up operation, mirror-up operation is halted as "Mirror Error".

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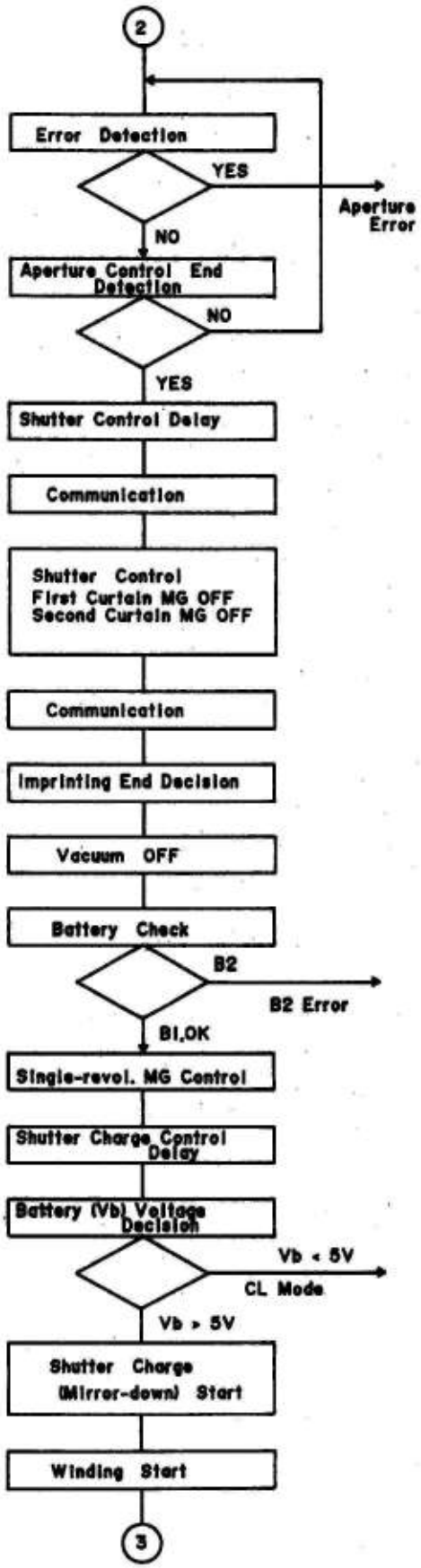

When aperture control end can not be detected within 500 msec from start of mirror-up operation, aperture end detection is halted as "Aperture Error".

Error processing: Operation halt

Shutter control delay: Sutter first curtain magnet OFF is delayed at least 20 msec from shutter mechanism hook lever release.
(Approx. 15 msec after mirror-up detection)

CPU2→CPU1
Mirror-up control end, Command wait status output

CPU1→CPU2
Command: CH (winding)
Without film, winding is not done in all drive modes (MULTI, B, M, S, CL, CH, S2, S10).
There is only charge (mirror-down) operation (command: mirror-down) irrespective of dial setting.
Error processing: Operation halt

Shutter charge control delay:
Delayed at least 26.3 msec from shutter second curtain magnet OFF.
(16.3 msec delay from shutter second curtain magnet OFF from charge motor drive start)
Even if drive mode dial is set at CH, it will be automatically switched to CL if battery voltage is 5V or below.
(Low power consumption)

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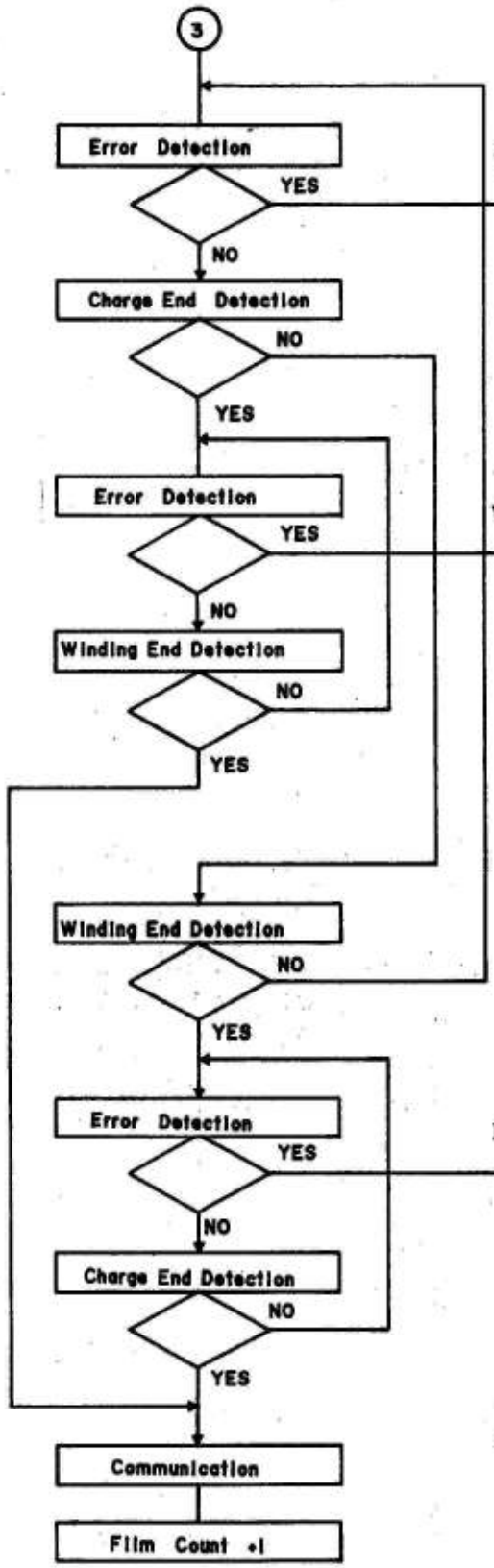

Winding Error: When winding does not end within 800 msec from charge start.
Error processing: Operation halt

Winding Error: When winding does not end within 800 msec from charge start.

Error processing: Operation halt

Mirror Error: When shutter charge (mirror-down) does not end within 800 msec from charge start.

Error processing: Operation halt

CPU2→CPU1
CH control end, Command wait status output

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C-IC

Outline of Functions

Power for IC operation is Vcc, which is being applied constantly.
In0, which is the reset terminal, is reset when In0=H. Without the batteries removed, In0 is always L.

C-IC performs the following four functions:

1. Power and CPU reset control
2. Communication
3. Extension of input ports
4. Shutter control

of these functions, the OFF→ON control of power (V DD) only is performed by the IC alone. Other functions are operated upon receipt of commands from the CPU.
As V DD goes H, the IC starts oscillation at 4 MHz, and then it keeps operating with 4 MHz as system clock.

1. Power and Reset Control

(1) The ON/OFF control of power to the camera, which is the ON/OFF control of V DD, is done by this IC.

① Power ON

There are 9 ports of power ON input. When any one port undergoes H→L (SW=ON), L(Open Collector) is output to the PH signal and V DD is output from the DC-DC converter.

The power ON input ports are S0 to S8. (See the table for correspondence between ports and switches.)

S0 to S7 operate as power ON switches only when the LOCK terminal is H (=Main SW ON or AE Lock). Hence, with the main switch in the OFF position, the camera will not operate even if the power on switch is pressed.

As the LOCK terminal undergoes a change of L→H (=Main SW OFF→ON), the output of PH signal=L is given.

S8 outputs PH=L at a change of H→L or L→H irrespective of the status of the LOCK terminal.

② Power OFF

When a power OFF command is sent form the CPU,
PH=H (Open Collector=OFF) is output
and the VDD output of the DC-DC converter
turns OFF.

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(2) Reset output

The reset control of CPU2 is performed by this IC.

① Reset release (RESET=H)

After the output of a VDD output signal (PH signal), the VDD output voltage of the DC-DC converter is detected. And when this voltage goes above 4.0V, H is output from the RESET terminal.

② Reset

When a power OFF command is sent from CPU1, L is output from the RESET terminal.

2. Communication

Commands and data are received from CPU1, and port statuses of C-IC are transmitted to CPU1.
Communication is performed, using 4-bit data bus(bi-lateral)and 3-bit control line (C-IC input).

(1) Data reception from CPU1

Communication consists of:

{Command: 4 bits} + {Data 1: 4 bits} + {Data 2: 4 bits}

(2) Transmission to CPU1

{Command: 4 bits} + {Data 1: 4 bits} + {Data 2: 4 bits}

3. Extension of Input Ports

This IC has input ports of S0 to S19. The status (L or H) of each port is transmitted to CPU1 upon receipt of readout command from CPU1.
The status is sent in 8 bits (4 bits × 2 by a single command.)

4. Shutter Control

The M1 terminal controls the first curtain magnet, and the M2 terminal the second curtain magnet.

A hold signal (M1 and M2 at the same time) is output immediately before mirror-up.

- For both M1 and M2, a hold is done by a suction of constant current of 22 mA. This current is determined by the resistance between R terminal and GND. That is, the current is 22 mA for 5.6Ωk.
- Because of the constant current drive, the voltage of M1 and M2 at hold varies with the battery voltage. The battery voltage is 4.4V.

First Curtain OFF (MI voltage=battery voltage) is output after completion of mirror-up. Then after a lapse of specified shutter time, Second Curtain OFF (M2 voltage=battery voltage) is output. Refer to the sequence time chart.

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C-IC Terminal Functions

Pin-No.	Terminal	Signal	Function
1	DO	DO	CPUI-C-IC data bus
2	DI	DI	CPUI-C-IC data bus
3	D2	D2	CPUI-C-IC data bus
4	D3	D3	CPUI-C-IC data bus
5	C/D	C/D	CPUI-C-IC command/data
6	W/R	W/R	CPUI-C-IC write/read
7	CLK	CLK	CPUI-C-IC communication clock
8	CS		Grounding
9	BCNT		Connection with CHS
10	TRIG		No-connect.
11	MI		First curtain MG. output
12	M2		Second curtain MG. output
13	R		Shutter MG. current resistance
14	BZ		No-connect.
15	RESET	RESETOUT	CPU2 reset output
16	Vcc	Vcc	Vcc
17	InO	InO	C-IC reset input
18	PH	PH	Power hold output
19	TRB	TRB	TRB
20	DCC	DCC	Vdd level detection
21	GND	GND	Grounding
22	125K		No-connect.
23	500K		No-connect.
24	4MHZ		No-connect.
25	XOUT		4MHz oscillator connection
26	XIN		4MHz oscillator connection
27	VDD	VDD	VDD input
28	LOCK	MAIN	Main SW input
29	SO	RELEASE	Release SW input
30	SI	CHECK	Check SW input
31	S2		No-connect
32	S3	TESTI	Test mode input
33	S4	PREVIEW	Preview SW input
34	S5	TEST2	Amp test input
35	S6	REWIND	Rewind SW input
36	S7	S.CUR.COMP.	Second curtain completion SW input
37	S8	BACK COVER	Back cover SW input
38	S9	DRV2	Drive mode 2 input
39	SIO	DRVI	Drive mode I input
40	SII	DRVO	Drive mode O input
41	SI2	ABC0.5	ABC I input
42	SI3	ABCI.0	ABC O input
43	SI4	DX	DX-SW input
44	SI5	COMPENS. +	+Compensation SW input
45	SI6	COMPENS. -	-Compensation SW input
46	SI7	MECH. BULB	Mech. bulb SW input
47	SI8	AE LOCK	AE lock SW input
48	SI9	METER SW	AVE/SPOT switching SW input
49	GND	GND	Grounding
50	NC		No-connect.
51	BCNT		Connection with CHS
52	CHS		Connection with BCNT
53	CHC		No-connect.
54	SP		No-connect.
55	LAD		No-connect.
56	NC		No-connect.

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Light Metering IC

The light metering IC's of the same time type are used for center-weighted average metering and spot metering.

The center-weighted average metering IC is located in the upper part of the viewfinder, and the spot metering IC in the lower part of the mirror box, both together with their respective optical systems. The light metering IC outputs voltage VO corresponding to the brightness and voltage VREF in proportion to the absolute temperature. VO is the voltage logarithmically compressed within the IC. See the next page for the temperature characteristics of VREF.

The CPU performs AD conversion using VREF as AD reference voltage (AD result = 256) and uses it as light metering data. Center-weighted average metering is handled by CPU1, and spot metering by CPU2.

VO values are: Temperature = 25°C, Brightness = LV12, lens = 50mm/F1.4
TYP values are: Center-weighted average metering output: 1.055 V
Spot metering output: 0.863 V

VO changes 90mv for a change in brightness of 1EV. The greater the brightness, the higher the voltage. VO values and their variations are in proportion to the absolute temperature.

Errors of VO VREF as well as those of the optical system are compensated by internal operation of the CPU. As for the adjustment, refer to "exposure reference value/exposure inclination" in the section on adjustment.

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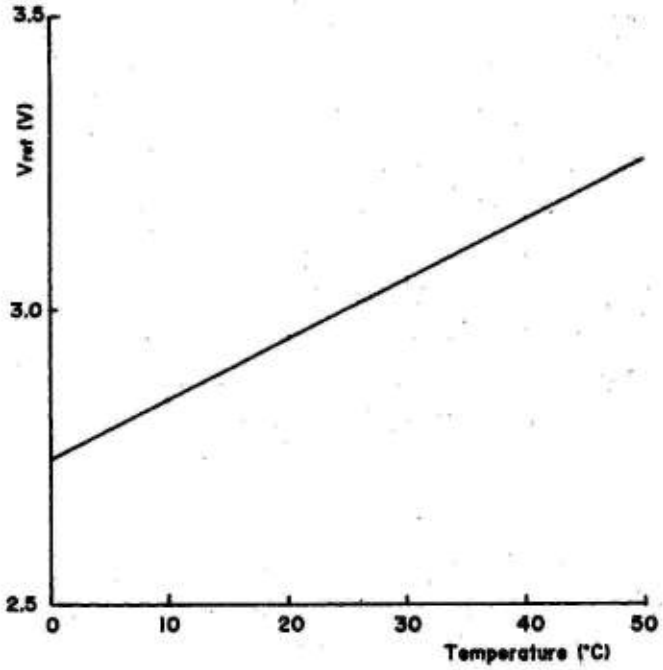
Photometry Vref Temperature Characteristics

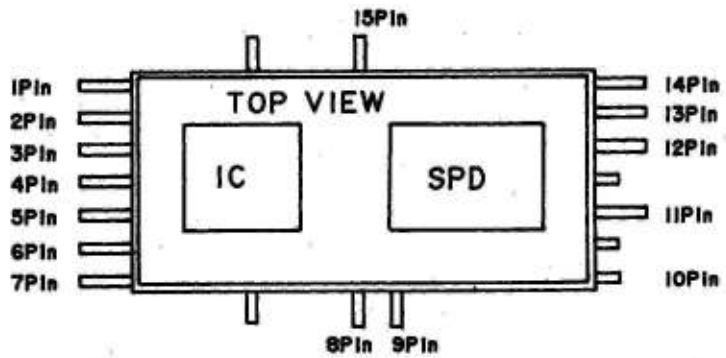


Temp. (°C)	Vref (V)
0	2.75
5	2.80
10	2.85
15	2.90
20	2.95
25	3.0
30	3.05
35	3.10
40	3.15
45	3.20
50	3.25

L. Metering IC Terminals

Pin No.	Symbol	Function
1	SEL0	No-connect.
2	SEL1	No-connect.
3	SEL2	No-connect.
4	GND	Grounding
5	PI	No-connect.
6	PULSE	No-connect.
7	VCC	VDD
8	SPDB	No-connect.
9	SPDA	No-connect.
10	SPDD	No-connect.
11	CATHODE	No-connect.
12	SPDE	No-connect.
13	VO	Metering output
14	VREF	AD ref. voltage
15	SPDC	No-connect.

Photometry IC Terminal Arrangement



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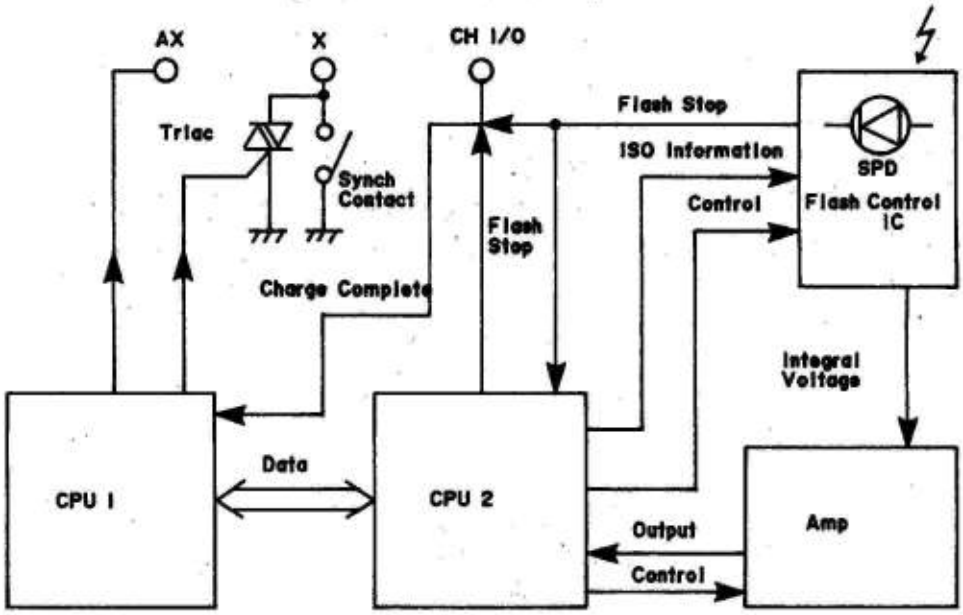
Pre-flash & Direct Flash Control Circuit



o Direct Flash Control

At the input of charge complete signal in CPU1, the CPU judges it as the setting of flash control mode. A flash is emitted when the shutter release is pressed and the synch contact is closed. In parallel with this, CPU2 performs the control of the Flash light metering IC. The Flash light metering IC integrates the light received by the SPD, makes a comparison with the reference voltage relative to ISO, and stops the emission of the flash. After the stoppage of flashing, the integration is continued for the shutter time. And finally the integral voltage is subjected to A/D conversion, and the result is used as display data.
The same operation takes place also when a flash is emitted at the AX signal with the flash set in the second curtain synch mode.

o Pre-flash

When the pre-flash lever is turned on, the CPU judges the presence of charge complete signal input in CPU1 as use of the dedicated flash and its absence as use of a general flash.

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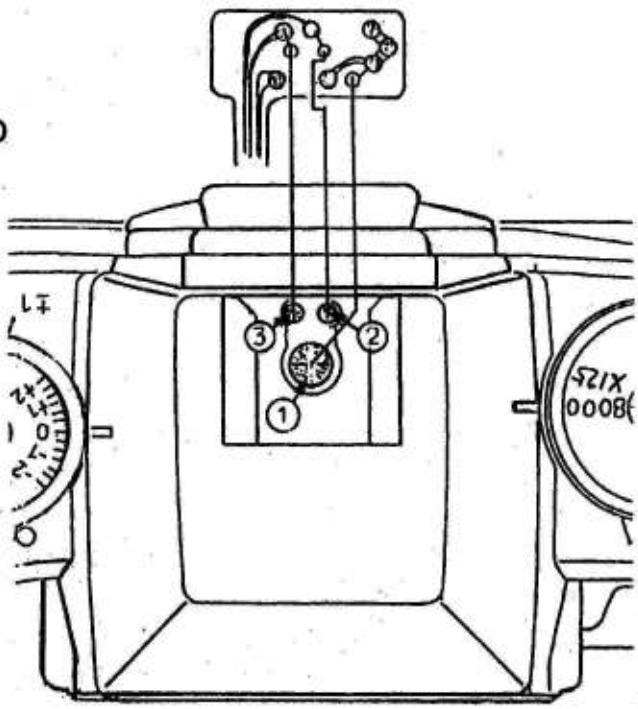
With use of the dedicated flash, after the completion of aperture stop down, CPU1 performs the flash control of first curtain synch. and second curtain synch., whereas CPU2 performs the control of the flash control IC and integration the same way as with direct flash control.
With use of a general flash, flash control is first curtain synch. only. And in pre-flash first curtain synch., an flash is emitted by turning on the triac connected in parallel with the synch control.
In ten pre-flash function, the CPU carries out not only the A/D conversion of integral voltage but also the meaurement of time from flash start to end.
In flash photography with the pre-flash lever on, flash control is not done, but the time above is used to stop each flash.

Hot-shoe terminal

① X
② AX
③ CH I/O



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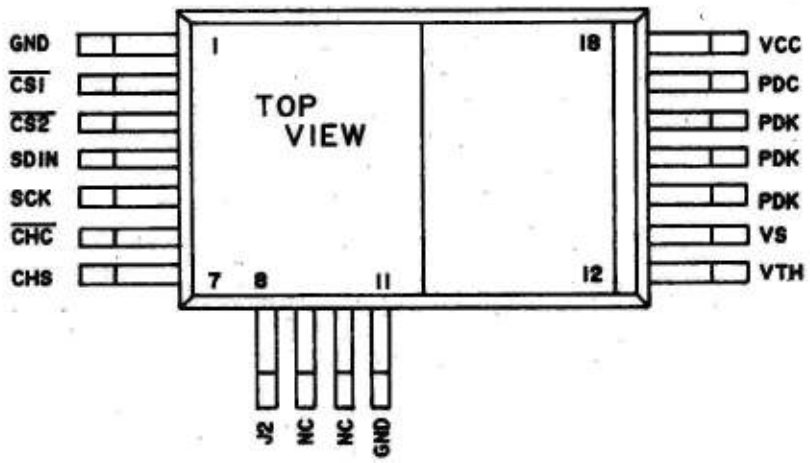
Flash Control IC Pin Assignment and Terminals

〔Flash control IC terminal arrangement〕



Terminals of Flash Control IC

PIN No	Terminal	Function
1	GND	
2	$\overline{CS1}$	Chip select terminal 1
3	$\overline{CS2}$	Chip select terminal 2
4	SDIN	ISO code serial data input terminal
5	SCK	Serial clock input terminal
6	$\overline{CHC}$	Flash control integration start signal input terminal
7	CHS	Flash control stop signal output terminal
8	J2	VTH bias voltage terminal
9	NC	
10	NC	
11	GND	
12	VTH	Flash control output comparator ref. voltage terminal (for ISO)
13	VS	Reference voltage output terminal approx. 1.2V
14	PDK	Flash control integration MOS AMP-input terminal (SPD cathode terminal)
15	PDK	Flash control integration MOS AMP-input terminal (SPD cathode terminal)
16	PDK	Flash control integration MOS AMP-input terminal (SPD cathode terminal)
17	PDC	Flash control integration MOS AMP output terminal
18	VCC	Supply voltage application terminal

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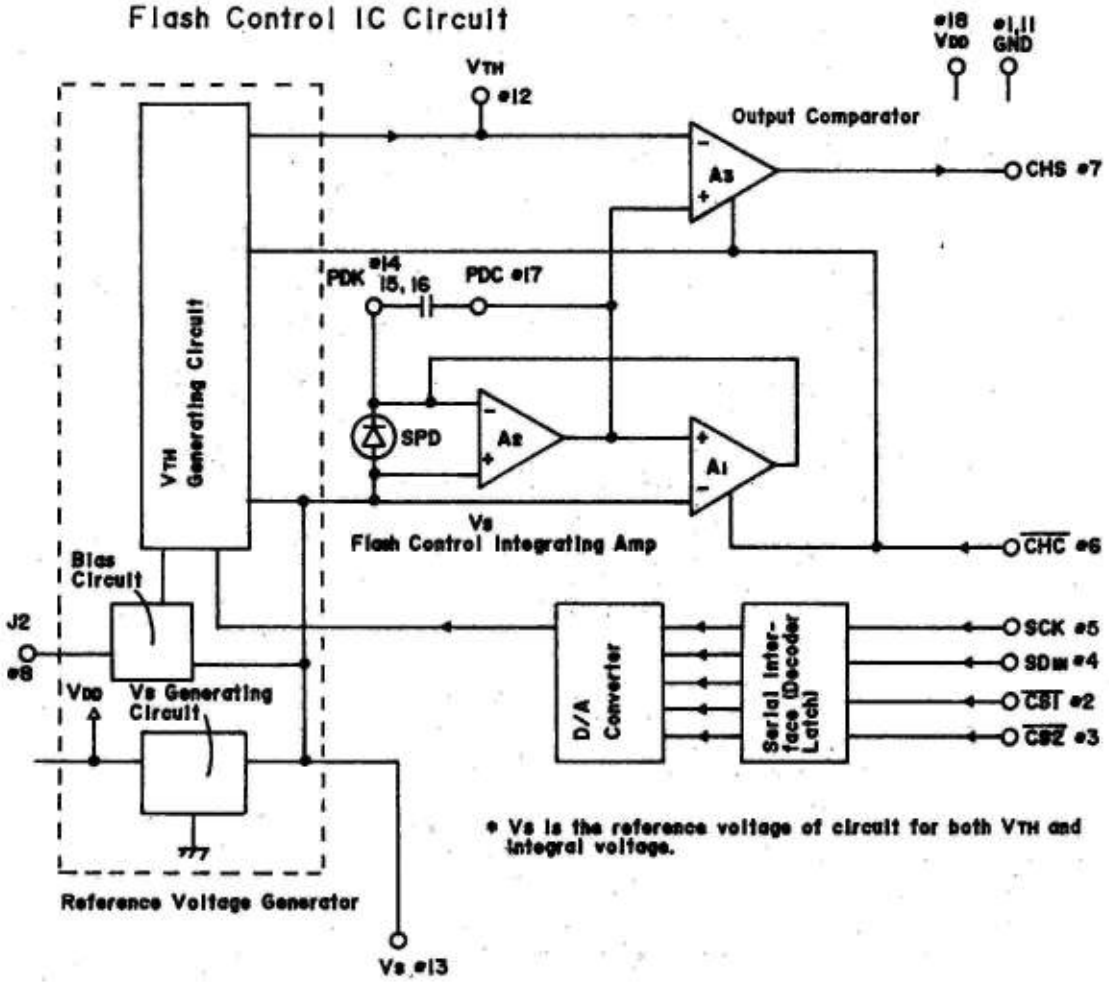
Flash Control IC Circuit



① V_{TH} is determined by the codes sent in serial communication from terminals #2 to #5. The codes change according to ISO.

② As $\overline{CHC}$(#6) is turned low, short amp A1 cancels the short of integrating amp A2. At this time, V_{TH} rises, too.

③ The A2 amp not shorted storages the light irradiated to the SPD in the integrating condenser connected between PDK(#14－16) and PDC (#17). The result of integration becomes the output voltage of the A2 amp.

④ The integral voltage is input to comparator A3. The other input is V_{TH} determined in ①. When the integral voltage accord with V_{TH}, the flash stop signal CHS (#7) goes "H", thus stopping the flash emission.

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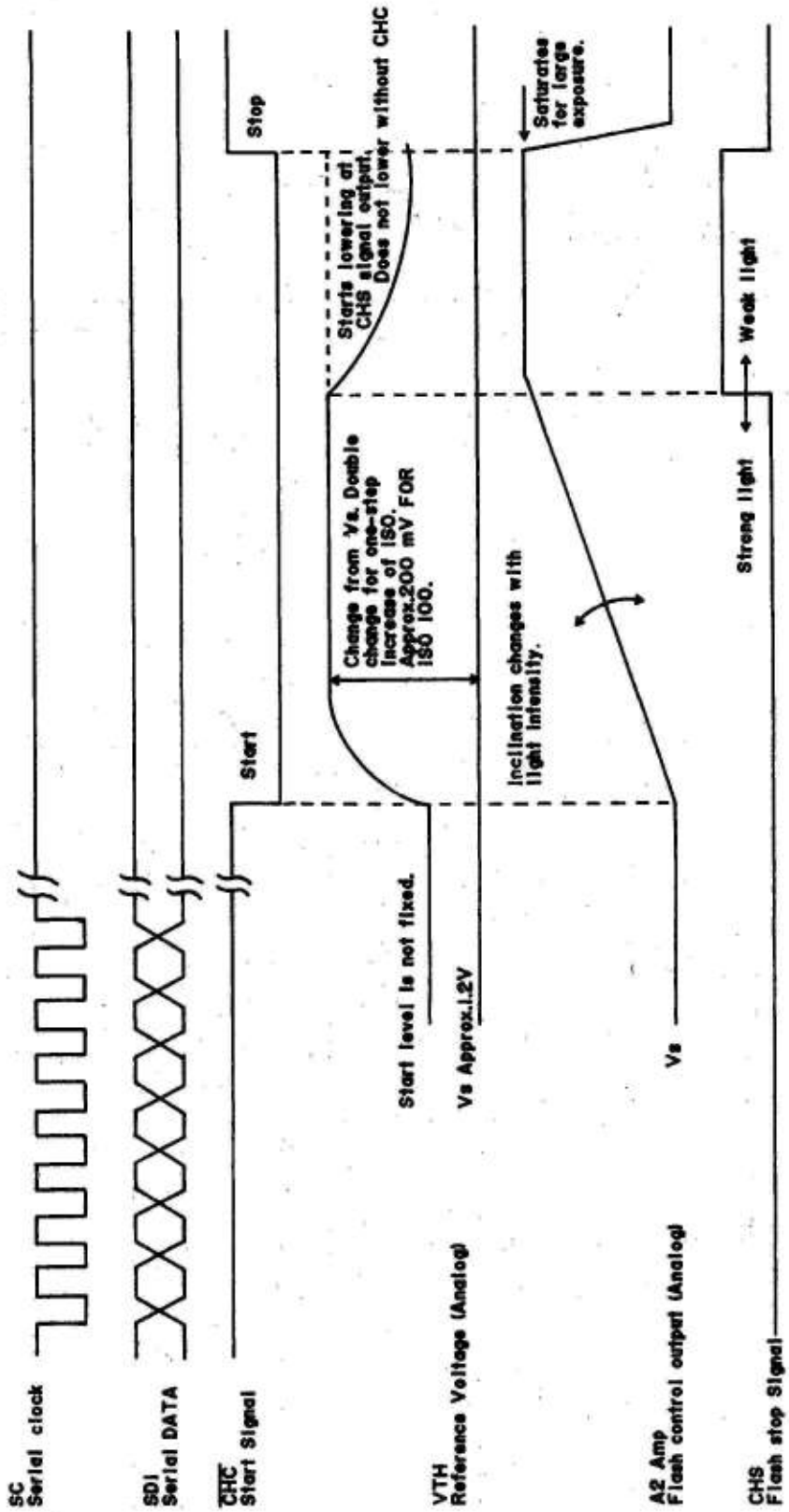
Integrating Time Sequence



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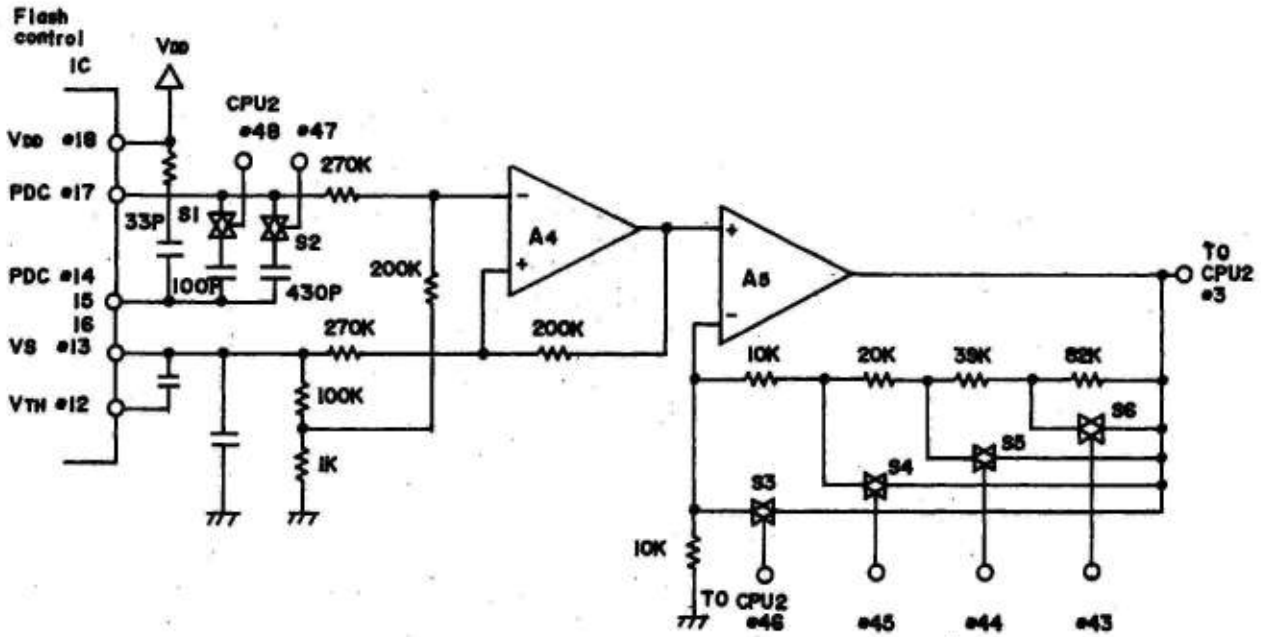
External Circuit



① The integrating condenser connected between PDK (#14, 15, 16) and PDC (#17) of the flash control IC comprises three kinds of analog switches to obtain a dynamic range.

② The integral voltage is reduced to 0.74 percent by the A4 amp. The integral voltage to be input to the A4 amp uses Vs as reference. Therefore, the Vs component of integrating output is subtracted, using the A4 amp as a differential amp and Vs as the other input.

③ To prevent the absence of output on the A4 amp despite the input of integral voltage due to the minus offset of the A4 amp, the offset is given to the integral voltage at the stage of input, so that there is the output of A4 amp from the beginning. This offset is made by dividing Vs 100:1 with resistors of 100 K and 1 K.

④ The integral voltage whose Vs component has been subtracted is input to the A5 amp. The A5 amp is a non-inversion amplifier with variable gains of 1, 2, 4, 8, and 16. The gain is controlled from CPU2 by switching the analog switch.

⑤ The gain is controlled according to the ISO to optimize the voltage level for the A/D conversion of CPU2.

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ISO vs. Serial Codes and Amp Gains

ISO	Direct flash control		Pre-flash	
	Serial code	Amp gain	Serial code	Amp gain
Compens. -⅓	11110	×1	11110	×1
-⅔	11110			
-1	11101			
-1⅓	11100			
-1⅔	11010			
-2	11001			
6	11000			
8	10110			
10	10101			
12	10100			
16	10010			
20	10001	×2	11101	
25	10000		11100	
32	01110		11010	
40	01101	×4	11001	
50	01100		11000	
64	01010		10110	
80	01001	×8	10101	
100	01000		10100	
125	00110	×16	10010	
160	00101		10001	×2
200	00100		10000	
250	00010		01110	
320	00001		01101	×4
400	00000		01100	
500			01010	
640			01001	×8

ISO	Direct flash control		Pre-flash	
	Serial code	Amp gain	Serial code	Amp gain
800	00000	×16	01000	×8
1000			00110	×16
1250			00101	
1600			00100	
2000			00010	
2500			00001	
3200			00000	
4000				
5000				
6400				
Compens. -⅓				
-⅔				
-1				
-1⅓				
-1⅔				
-2				

* For the same ISO values, direct flash control and pre-flash function use different serial codes and amp gains.

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Relationship between Serial Code and V_{TH}
(ISO: reference values that can vary with adjustment values)

Serial code	V_{TH} (mV)	ISO	
		Direct flash control	Pre-flash
11110	2500	Compens. $\frac{2}{3}$. $\frac{1}{3}$	Compens. $\frac{2}{3}$ ~ ISO16
11101	2000	Compens. $\frac{1}{3}$	ISO 20
11100	1600	$\frac{2}{3}$	25
11010	1250	$\frac{1}{3}$	32
11001	1000	1	40
11000	800	ISO 6	50
10110	640	8	64
10101	500	10	80
10100	400	12	100
10010	320	16	125
10001	250	20	160
10000	200	25	200
01110	160	32	250
01101	125	40	320
01100	100	50	400
01010	80	64	500
01001	64	80	640
01000	50	100	800
00110	40	125	1000
00101	32	160	1250
00100	25	200	1600
00010	20	250	2000
00001	16	320	2500
00000	12.5	ISO400 ~ Compens. - $\frac{1}{3}$	ISO3200 ~ Compens. - $\frac{1}{3}$

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Description of control

1. Start of flash control

   Flash control is performed if the charge complete signal is input to the camera immediately before transmission of the flash control command from CPU1 to CPU2 (refer to "communication").
   In pre-flash function, however, flash control is performed irrespective of the presence or absence of charge complete.

2. Setting of reference voltage V_{TH}

   With flash control in effect on completion of communication of the flash control command, the ISO code is sent in serial communication between CPU2 and flash control IC.

3. Setting of gain of external amp

   After the end of serial communication, the gain corresponding to ISO is set. The states of the analog switches are as shown at right.

Gain	S3	S4	S5	S6
× 1	ON	OFF	OFF	OFF
× 2	OFF	ON	OFF	OFF
× 4	OFF	OFF	ON	OFF
× 8	OFF	OFF	OFF	ON
× 16	OFF	OFF	OFF	OFF

4. Setting of storaging condenser

   Direct flash control: S1, S2····OFF
   33pF selected
   Pre-flash : S1····ON, S2····OFF
   133pF selected
   S2 is turned ON during storage for pre-flash.

5. Timing chart

   Flash, storage and flash control are performed after operations 1 to 4.

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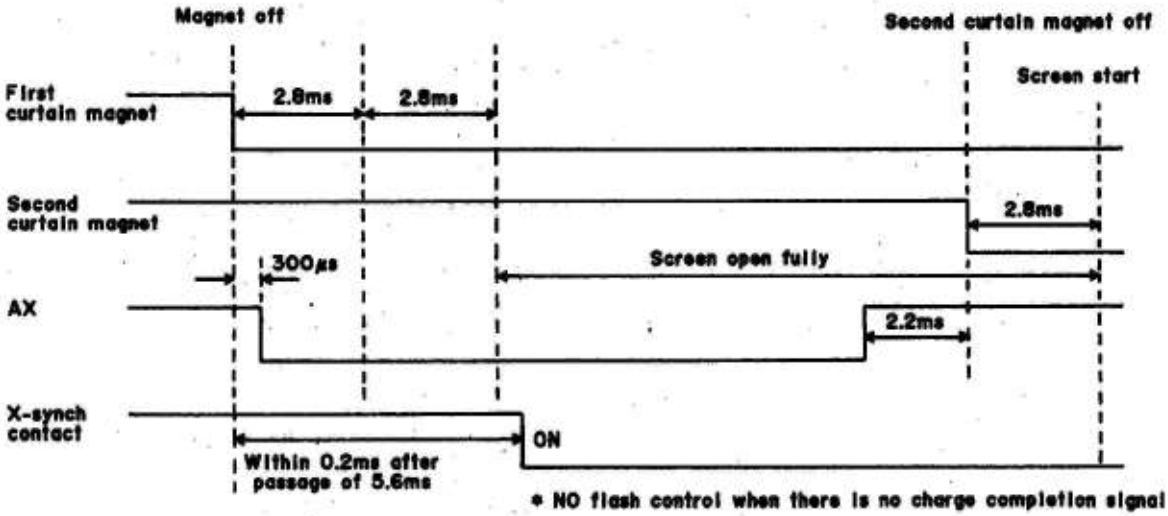
5. Flash Timing

5-1-1

The AX signal is turned low 300 μs after turning-off of the first curtain magnet. The synch contact turns on within 0.2 ms after 5.6±0.7 ms has passed since turning-off of the first curtain. (First curtain cynch: Time is as per shutter specificaiton.)
The AX signal is turned high 2.2 ms before turning-off of the second curtain. (Second curtain synch)

Flash timing

① Normal release sequence



5-1-2

With the pre-flash switch turned on and the aperture stopped down, the triac is turned on 2.0 ms after turning-low of the AX signal. (First curtain synch)
If the flash does not light at this point, the AX signal is turned high. (Second curtain synch)
If the flash lights, no further control is performed.

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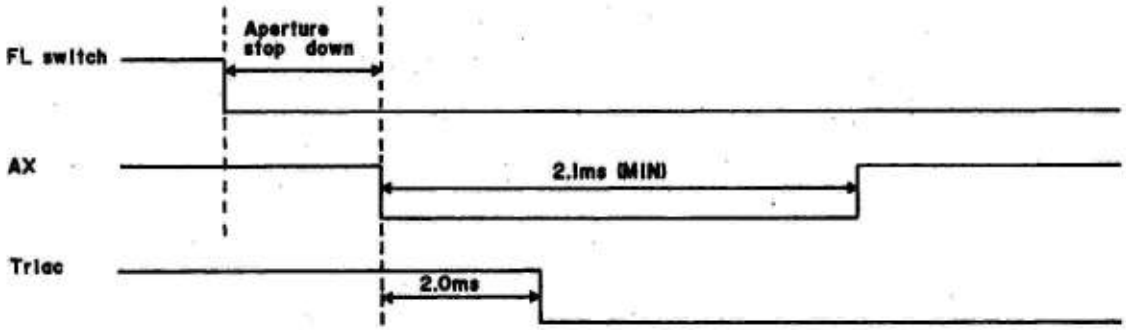
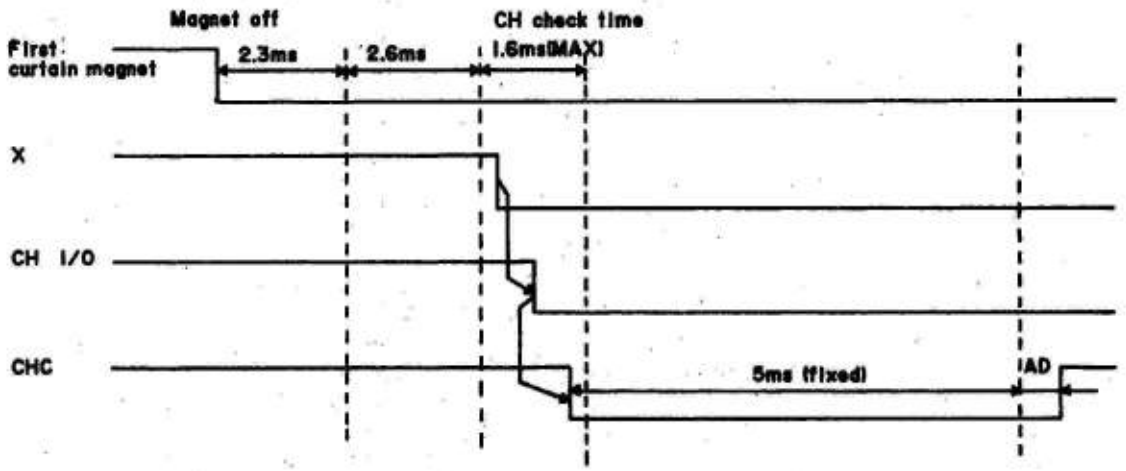
② Pre-flash



5-2 Storage Timing

5-2-1 Direct flash light control

The CH I/O is checked for 1.6 ms (max.) after 4.9 ms has passed since turning-off of the first curtain magnet and storage is started when the CH I/O turns low during the check.
The storage time is constantly 5 ms irrespective of the shutter time. Five milliseconds, later, A-D convention is performed and then control is completed.



When the flash does not light even by this flash control, the second curtain synch control is started. The $\overline{CHC}$ is turned low 6 μs before turning-high of the AX signal and then storage is started. The CH I/O is checked for 64 μs (max.) after turning-high of the AX and when the CH I/O turns low, storage is performed for 5 ms (fixed) and control is completed after A-D convertion. If the CH I/O keeps high, the $\overline{CHC}$ is turned high and control is completed after interruption of storage.

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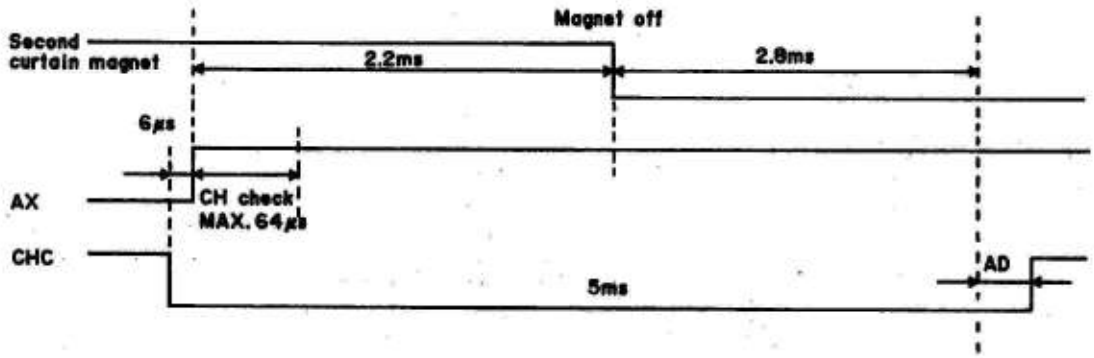
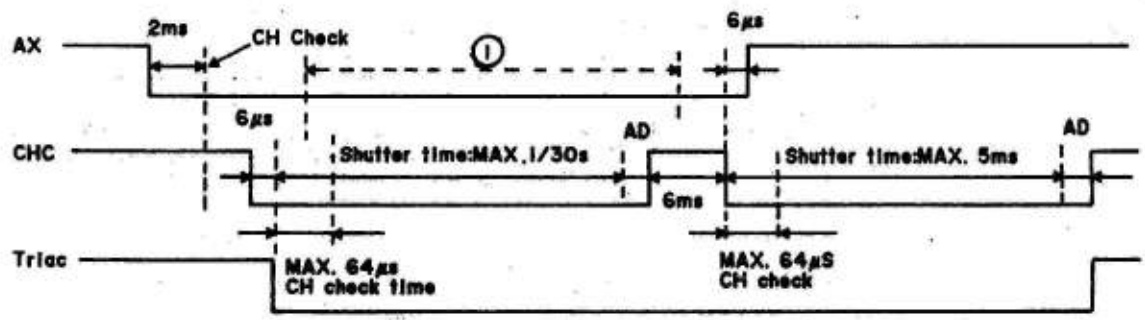


5-2-2 Pre-flash

The CH I/O is checked 2 ms after turning-low of the AX signal and the triac is turned on when the CH I/O turns high. The $\overline{CHC}$ is turned low 6 μs before turning-on of the triac and then storage is started. After turning-on of the triac, the CH I/O is checked for a maximum of 64 μs and storge is continued if the CH I/O turns low during the check. The storage time is a maximum of 1/30 s, which is equal to the shutter time in this case. (First curtain synch)

The $\overline{CHC}$ is turned low 6 μs before turning-high of the AX signal and storage is started. After turning-high of the AX, the CH I/O is checked for a maximum of 64 μs and storage is continued if the CH I/O turns low during the check. The storage time is a maximum of 5 ms, which is equal to the shutter time in this case. If the CH I/O keeps high, control is completed after interruption of storage. (Second curtain synch)



* Control ① only is performed when there is no charge completion signal.

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CPU1

(1) Outline of functions

① Read of time code, exposure mode, theta compensation, aperture setting and ISO setting value
② Read of measured data by center-weighted average metering
③ Exposure operation according to setting
④ Display on aperture LCD (lower area in viewfinder) and counter LCD
⑤ EL drive control
⑥ Power hold control
⑦ EEPROM read/write control
⑧ C-IC port read
⑨ Communication with CPU2: DX data, spot metering, flash control, data receiving, operation command transmission
⑩ Pre-flash control
⑪ Shutter control (via C-IC)
⑫ Self-timer LED flickering control

(2) Notes

Power source

The CPU1 is driven at VCC voltage. It is not reset as long as the battery is not removed. Resetting is controlled by the reset IC. The IC gives a reset signal when VCC drops below 3.7 V. When a new battery is installed, resetting is not performed until VCC rises above 3.7 V.

Power off

The CPU1 operates at 8 MHz clock while power to the camera is turned on. It is in wait mode after power-off. In wait mode, the CPU does not operate at 8 MHz clock, but operates at 32 KHz.
LCD control only is performed in wait mode. The current consumption in this mode is about 7 μA (about 20 μA in whole). The CPU1 is returned from wait mode to normal mode by interruption from the CPU2 (rise of RCK). Mode transition during power-on is as described below.

Power switch on → C-IC → (PH) DC-DC converter → (VDD) CPU2 → (PCK) CPU1

Power hold

Power is held on for about 16 seconds after operation of a user setting switch or dial. This power-hold time of 16 seconds is renewed at the turning-off of the switch which is operated during power-hold. Switch operation and counting of 16 seconds are controlled by the CPU1. After passage of 16 seconds, the CPU1 gives a power-off command to the C-IC and enters in wait mode.

Passage of 16 sec = CPU1 → (Power-off command) C-IC → (PH) DC-DC converter

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EL drive

The EL is driven at AC high voltage. The DC–DC converter produces the AC high voltage while the CPU1 gives a clock signal to the converter. The EL brightness is set to one of two levels according to the clock signal.

EL drive clock

Low brightness drive: Duty (L:H)=1 : 1 Frequency 4.17 kHz

High brightness drive: Duty (L:H)=1 : 4 Frequency 4.17 kHz

For high brightness, operation of 7 ms high brightness drive plus 5 ms low brightness brive is repeated.

Switching between two brightness levels are controlled according to the result of center-weighted metering.

The drive mode is changed from low brightness to high brightness when the metering result is EV10, or from high brightness to low brightness when EV9.

Data read via A–D conversion

The ISO and aperture setting values are transmitted to the CPU1 as resistance division voltages. The CPU1 reads there voltages via A–D conversion. The reference voltage for A–D conversion is the operation voltage (VCC) of the CPU.

The difference between the setting value and the A–D conversion value due to the errors in the VCC and resistance is adjusted by a reference value adjusting value and inclination adjusting value.

The reference value adjusting value adjusts the whole level shift and the inclination adjusting value adjusts the change per step.

→ For details, see "Adjustment"

Light Metering

The output voltage of the metering IC is read via A–D convertion. In this case, the reference voltage for A–D conversion is the V REF voltage of the metering IC. (Switching between V REF and VCC is performed in the CPU.) The difference between the metering output and the V REF is adjusted be the metering reference adjusting value and metering inclination adjusting value. The reference adjusting value adjusts the whole level shift and the inclination adjusting value adjusts the output change caused by brightness change.

→ For details, see "Adjustment".

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Communication between CPUs

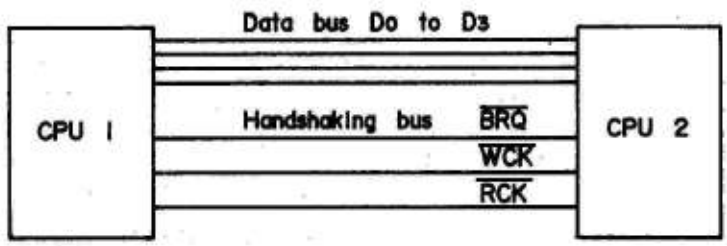
The CPU1 commands the CPU2 to control various operations of the camera. The CPU2 analyzes each command from the CPU2 and controls data sending and receiving and mechanical operations. In each sequence, the CPU issues commands continuously for a series of operations.

After each operation by a command, the current state of the CPU2 is returned to the data line as a status code.

When film rewinding has been started by the rewinding start command, the status is changed at every reverse of the frame counter and the CPU1 display the counting down.

1. Connection

The CPU1 is connected to the CPU2 via a 4-bit data bus and three handshaking buses.



① Data bus D_0 to D_3
Transmits and receives commands, data and status information, The input and output bi-lateral are interchangeable.

② $\overline{BRQ}$ (Bus Request) CPU1 → CPU2
Controls the transmission direction of the data bus. When the $\overline{BRQ}$ is low, the CPU2 is not changed to the output side.

③ $\overline{WCK}$ (Write Clock) CPU1 → CPU2
Indicates that the command or data issued by the CPU1 is confirmed. (Read request to CPU2)

④ $\overline{RCK}$ (Read Clock) CPU2 → CPU1
Indicates the state concerning the read by the CPU2. Turning from "H" to "L" indicates that the CPU2 is ready for read, "L" to "H" indicates the completion of read.

* The functions of the $\overline{WCK}$ and $\overline{RCK}$ are reversed when data are transmitted from the CPU2 to the CPU1.

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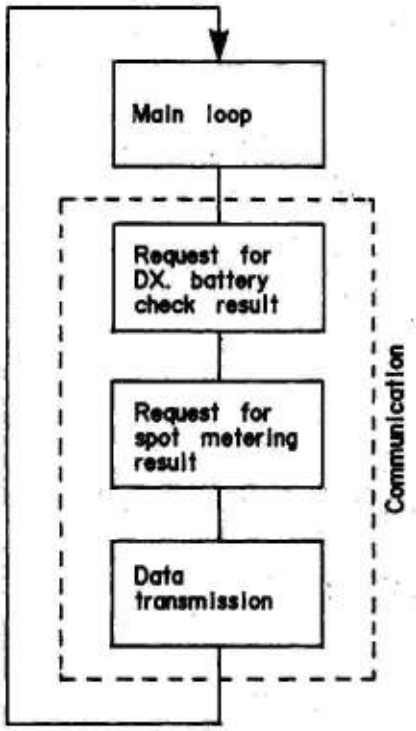
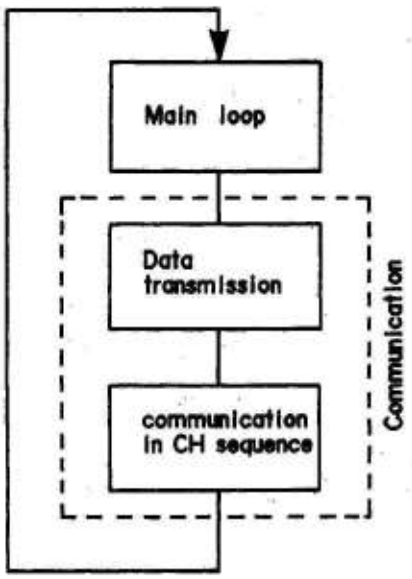
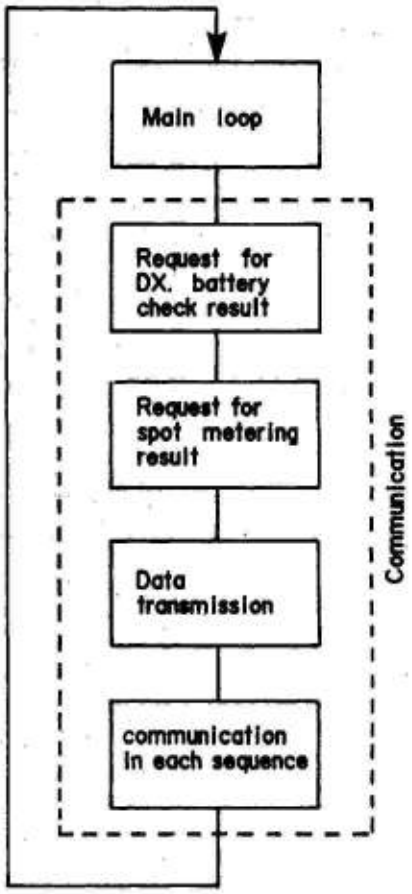
Communication Flow



(1) Power-on mode (no operation)



(2) CH mode



(8) Operation other than (2)

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CPU1 Terminal Functions

Pin No.	Terminal	Signal	Function
1	IN4	— —	NO Connection
2	IN3	FL Meter	Flash meter switch input
3	IN2	Metering A	Average metering voltage input
4	IN1	Aperture Data	Aperture setting voltage input
5	IN0	ISO Data	ISO voltage input
6	AVSS	GND	Grounding
7	VREF	Vref	Reference voltage for A-D conversion
8	Vcc	Vcc	Power voltage (Vcc=5V)
9	P57	ESC	Aperture stop down timing output
10	P56	CLK	C-IC communication clock output
11	P55	W/R	C-IC read/write output
12	P54	C/D	C-IC command/data output
13	P53	D3	C-IC data bus 3
14	P52	D2	C-IC data bus 2
15	P51	D1	C-IC data bus 1
16	P50	D0	C-IC data bus 0
17	P37	RW1	EEPROM chip selection
18	SCLK	SCK	Serial clock output
19	SOUT	SDO	Serial data output
20	SIN	SDI	Serial input
21	P33	ELCLK	EL drive clock output
22	P32	CS1	Adjusting unit request input
23	XCIN	←	32KHz
24	XCOUT	←	32KHz
25	INT1	RCK	CPU communication read clock
26	CNVSS	GND	Grounding
27	RESET	RST	Reset input
28	XIN	←	8MHz
29	XOUT	←	8MHz
30	VSS	GND	Grounding
31	P17	CHIO	Flash charge completion signal input
32	P16	AX	Second curtain synch output
33	P15	θ2	Theta compensation 2 input
34	P14	θ1	Theta compensation 1 input
35	P13	Open F3	Open F-stop code 3
36	P12	Open F2	Open F-stop code 2
37	P11	Open F1	Open F-stop code 1
38	P10	Open F0	Open F-stop code 0
39	P07	FLOUT	Pre-flash signal
40	P06	EBUSY	EEPROM read signal input

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CPU1 Terminal Functions

Pin No.	Termimal	Signal	Function
41	P05	WCK	CPU communication write clock output
42	P04	BRQ	CPU communication request output
43	P03	Da3	CPU communication data bus 3
44	P02	Da2	CPU communication data bus 2
45	P01	Da1	CPU communication data bus 1
46	P00	Da0	CPU communication data bus 0
47	P27	Self Control	Self-timer LED output
48	P26	Exposure 2	Exposure mode 2 input
49	P25	Exposure 1	Exposure mode 1 input
50	P24	TC5	Time code 4 input
51	P23	TC4	Time code 3 input
52	P22	TC3	Time code 2 input
53	P21	TC2	Time code 1 input
54	P20	TC1	Time code 0 input
55	VL3	VL3	LCD drive voltage input
56	VL2	VL2	LCD drive voltage input
57	VL1	VL1	LCD drive voltage input
58	COM0	COM0	AV-LCD common output 0
59	COM1	COM1	AV-LCD common output 1
60	COM2	COM2	AV-LCD common output 2
61	COM3	— —	No connection
62	SEG0	←	AV-LCD drive voltage output
63	SEG1	←	AV-LCD drive voltage output
64	SEG2	←	AV-LCD drive voltage output
65	SEG3	←	AV-LCD drive voltage output
66	SEG4	←	AV-LCD drive voltage output
67	SEG5	←	AV-LCD drive voltage output
68	SEG6	←	AV-LCD drive voltage output
69	SEG6	←	AV-LCD drive voltage output
70	SEG7	←	AV-LCD drive voltage output
71	SEG8	←	AV-LCD drive voltage output
72	SEG9	←	AV-LCD drive voltage output
73	SEG10	←	AV-LCD drive voltage output
74	SEG11	←	AV-LCD drive voltage output
75	SEG12	←	AV-LCD drive voltage output
76	SEG13	←	AV-LCD drive voltage output
77	SEG14	←	AV-LCD drive voltage output
78	SEG15	←	AV-LCD drive voltage output
79	SEG16	— —	No connection
80	SEG17	— —	No connection

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CPU2 Terminal Function

Pin No.	Terminal	Signal	Function
1	IN4	DX4	DX code 4 input
2	IN3	DX3	DX code 3 input
3	IN2	Flash Control	Flash control output voltage input
4	IN1	Metering	Spot metering voltage input
5	IN0	BC	Battery voltage input
6	AVSS	GND	Grounding
7	VREF	VREF	Reference voltage for A-D conversion
8	Vcc	VDD	Power voltage (Vcc=5V)
9	P57	Flash Stop	Flash stop signal output
10	P56	CHC	Flash control integration signal output
11	P55	CS1	Flash control IC chip selection
12	P54	F Close	Aperture stop down completion switch input
13	P53	DX2	DX code 2 input
14	P52	DX1	DX code 1 input
15	P51	DX0	DX code 0 input
16	INT3	ApertruePulse	Aperture pulse input
17	P37	CHS	Flash control stop signal input
18	SCLK	SCLK	Serial clock output
19	SOUT	SOUT	Serial data output
20	P34	Vacuum 2	Full section
21	P33	Vacuum 1	Suction at constant current
22	INT2	BRQ	CPU communication request input
23	P31	BUSY	Imprinting-in-frame switch input
24	P30	Imprinting	Imprinting signal/ACK signal output
25	INT1	PF Pulse	Perforation pulse input
26	CNVSS	GND	Grounding
27	RESET	RESET	Reset input
28	XIN	←	8MHz input
29	XOUT	— —	No connection
30	VSS	GND	Grounding
31	P17	PFLED	Perforation LED output
32	P16	FLED	Aperture LED output
33	P15	BCC	Battery check signal output
34	P14	WBK	Winding brake control output
35	P13	WIND	Winding control output
36	P12	LevolvingLimit	Revolving limit plunger control output
37	P11	FMG	Aperture ring stop signal output
38	P10	BRK	Mirror-up/down brake control output
39	P07	CHG2	Mirror-up/down control output
40	P06	CHG1	Mirror-up/down control output

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CPU2 Terminal Functions

Pin No.	Terminal	Signal	Function
41	P05	RE1	Rewinding/preview control output
42	P04	RE2	Rewinding/preview control output
43	P03	GC4	Gain control 4
44	P02	GC3	Gain control 3
45	P01	GC2	Gain control 2
46	P00	GC1	Gain control 1
47	P27	C Switching 2	Integration condenser switching 2
48	P26	C Switching 1	Integration condenser switching 1
49	P25	WCK	CPU communication write clock input
50	P24	RCK	CPU communication read clock output
51	P23	Da3	CPU communication data bus 3
52	P22	Da2	CPU communication data bus 2
53	P21	Da1	CPU communication data bus 1
54	P20	Da0	CPU communication data bus 0
55	VL3	←	LCD drive voltage input
56	VL2	←	LCD drive voltage input
57	VL1	←	LCD drive voltage input
58	COM0	←	S-LCD Common output 0
59	COM1	←	S-LCD common output 1
60	COM2	←	S-LCD common output 2
61	COM3	— —	No connection
62	SEG0	←	S-LCD drive voltage output
63	SEG1	←	S-LCD drive voltage output
64	SEG2	←	S-LCD drive voltage output
65	SEG3	←	S-LCD drive voltage output
66	SEG4	←	S-LCD drive voltage output
67	SEG5	←	S-LCD drive voltage output
68	SEG6	— —	No connection
69	SEG6	— —	No connection
70	SEG7	— —	No connection
71	SEG8	— —	No connection
72	SEG9	— —	No connection
73	SEG10	— —	No connection
74	P43	MUP	Mirror-up switch input
75	P42	CHARGE	Charge switch input
76	P41	F Open	Aperture open switch input
77	P40	Revolving Limit SW	Revolving limit switch input
78	SEG15	— —	No connection
79	SEG16	— —	No connection
80	SEG17	— —	No connection

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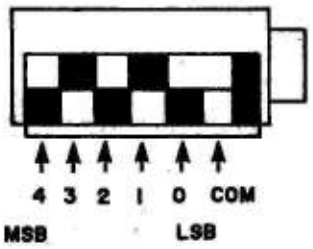
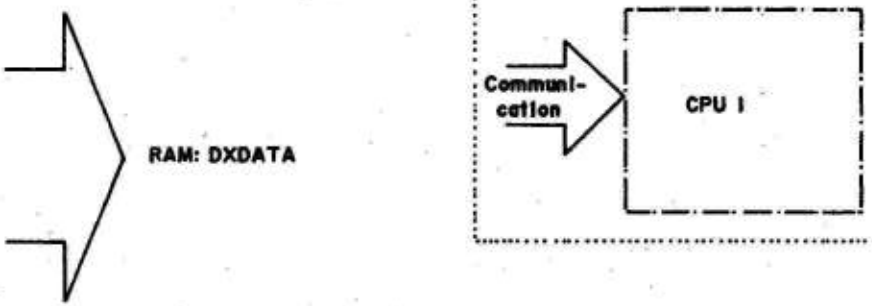
DX Read

Cartridge DX read



Cartridge DX code is read and stored in RAM.



ISO SPEED	DX code (Transmission data)	ISO SPEED	DX code (Transmission data)
25	10111	400	10011
32	01111	500	01011
40	00111	640	00011
50	10110	800	10010
64	01110	1000	01010
80	00110	1250	00010
100	10101	1600	10001
125	01101	2000	01001
160	00101	2500	00001
200	10100	3200	10000
250	01100	4000	01000
320	00100	5000	00000
		None DX	11111

CPU Signal Name	DX5	DX4	DX3	DX2	DX1
DX BIT	4	3	2	1	0

Transmission data	1	0
CPU signal	HI	LOW
Cartridge DX	Black	Silver

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EEPROM

EEPROM Terminal Functions

Pin No.	Symbol	Function
1	$\overline{CS}$	Chip selection. Low level during use. Input
2	$\overline{SCK}$	Serial clock. Clock terminal for serial communication. Input
3		Not used
4	DI	Data in. Data input terminal for serial communication
5	DO	Data out. Data output terminal for serial. Communication
6	Vss	Power source ⊖, GND level
7	RESET	Reset. Connected to CS. Input
8		Not used
9	RDY/BUSY	Busy, Low level during data read. Output
10	VDD	Power source ⊕

Content of EEPROM Stores

EEPROM stores the following data and reads out them during camera operation.

- o Adjusted values
- o Backup data

1) Release count
2) Metering data
3) Operation No.
4) Aperture display code
5) Time code
6) ISO ID number
7) Adjusting values for flash control and flash meter
8) Open F code
9) Flash control IC output
10) Flash control time
11) Status information 1
12) Status information 2
13) Status information 3
14) Winding subcommand
15) ABC counter
16) Exposure counter
17) EEPROM write counter

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EEPROM write timing

1. Shutter count
   - o At power-off
2. Operation No. and metered data
   - o At power-off
   - o At AE lock switch on
3. Aperture display code or time code
   - o At completion of pre-flash
   - o At completion of flash metering
   - o At change of flash meter setting (aperture, ISO or compensation)
4. Write counter
   - o At power-off
5. Adjusted values of ISO ID number, FL or flash control
   - o Same as 3
6. Open F or storage voltage
   - o Same as 3
   - o At power-off
7. Flash control time
   - o At completion of pre-flash
8. Status information 1 or 2
   - o At power-off
   - o At AE lock switch on
   - o At back cover opening
   - o At release on→off
   - o At valve opening
   - o At completion of mechanism initialization
   - o At T valve on
   - o At completion of loading
   - o At completion of rewinding
   - o At start of preview operation
   - o At valve closing
   - o At completion of preview operation
   - o At flash meter on
   - o At flash meter off
   - o At completion of S or CL sequence
   - o During mirror-up
9. Winding subcommand or status information 3
   - o Same as 8
10. ABC counter or exposure counter
    - o At back cover opening
    - o At completion of loading
    - o At power-off
    - o At completion of rewinding
    - o At completion of preview operation
    - o At Bulb opening
    - o At Bulb closing
    - o At flash meter off
    - o At reverse operation of exposure counter
    - o At release on→off
    - o During mirror-up
    - o At start of previw operation
    - o At flash meter on
    - o At cmpletion of S or CL sequence
    - o At completion of mechanism initialization

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P.C. Board Input Codes

1. Shutter P.C. board code pattern

Setting position		P.C. board pattern					Processing code (Hex)	
Time	TV value	D4	D3	D2	D1	D0		
8000	13	1	0	0	0	0	00	
4000	12	1	0	0	0	1	08	
2000	11	1	1	0	0	1	10	
1000	10	1	1	1	0	1	18	
500	9	1	0	1	0	1	20	
250	8	1	0	1	1	1	28	
125	7	1	1	1	1	1	30	
60	6	0	1	1	1	1	38	
(60)	6	0	1	0	1	1	38	Dummy pattern
30	5	1	1	0	1	1	40	
15	4	1	0	0	1	1	48	
8	3	1	0	0	1	0	50	
4	2	1	1	0	1	0	58	
2	1	1	1	1	1	0	60	
1S	0	1	0	1	1	0	68	
2S	-1	1	0	1	0	0	70	
4S	-2	1	1	1	0	0	78	
X125	7	1	1	0	0	0	28	

* The processing of dummy 1/60 is the same as that of 1/60.

2. Drive P.C. board code pattern

Setting position	P.C. board pattern			Processing code (Hex)
	D2	D1	D0	
S	1	1	1	80
CL	1	1	0	40
CH	1	0	0	10
SELF2	1	0	1	20
SELF10	0	0	1	02
MULTI	0	1	1	08

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3. Exposure mode code pattern (shutter P.C. board)

Setting position	P.C. board pattern		Processing code (Hex)
	DI	DO	
Av	1	0	02
Tv	0	0	00
M	0	1	01
B	1	1	03

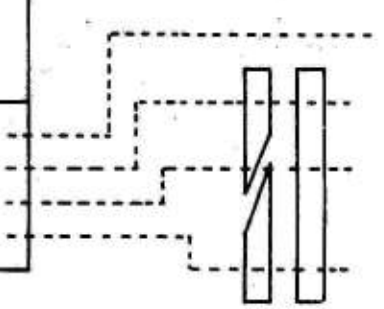
4. Open F.P.C. board code pattern

Setting position		P.C. board pattern				Processing code (Hex)
F value	AV value	D3	D2	DI	DO	
1.4	1.0	0	0	0	1	08
1.7	1.5	0	0	1	1	0C
2.0	2.0	0	0	1	0	10
2.4	2.5	0	1	1	0	14
2.8	3.0	0	1	1	1	18
3.5	3.5	0	1	0	1	1C
4.0	4.0	0	1	0	0	20
4.8	4.5	1	1	0	0	24
5.6	5.0	1	1	0	1	28

5. Theta compensation P.C. board

P.C. board pattern		Lens identification
DI	DO	
1	1	AE lens
1	0	MM lens with theta compensation
0	0	MM lens without theta compensation
0	1	MM lens without theta compensation

·Detection of MM lens



Pattern changed on December 26, 1989

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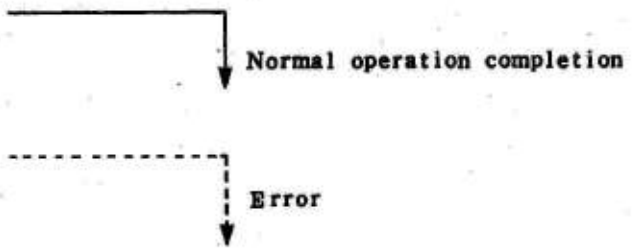
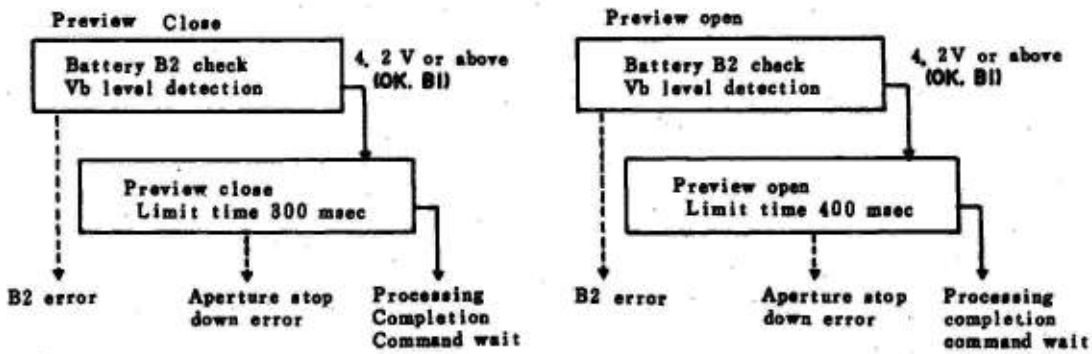
Error Detection

* Camera operation stops at the detection of an error.

	Counting start	Completion factor
Mirror-up limit time:	Charge motor reverse on	LOW(ON) detection of mirror up switch
Mirror-down limit time (Shutter charge) :	Charge motor forward on	LOW→HI detection of charge switch
Operation limit time for revolving limit magnet :	Revolving magnet on	LOW detection of revolving switch
Winding DC drive limit time (Pulse drive) :	Winding motor on	HI detection of revolving switch
Preview open limit time :	Rewind motor reverse on	LOW detection of aperture open switch
Preview close limit time :	Rewind motor forward on	LOW detection of aperture close switch
Rewinding limit time:	Rewind motor forward on	Detection of sprocket pulses (48 pulses) for one frame



Preview Error Processing



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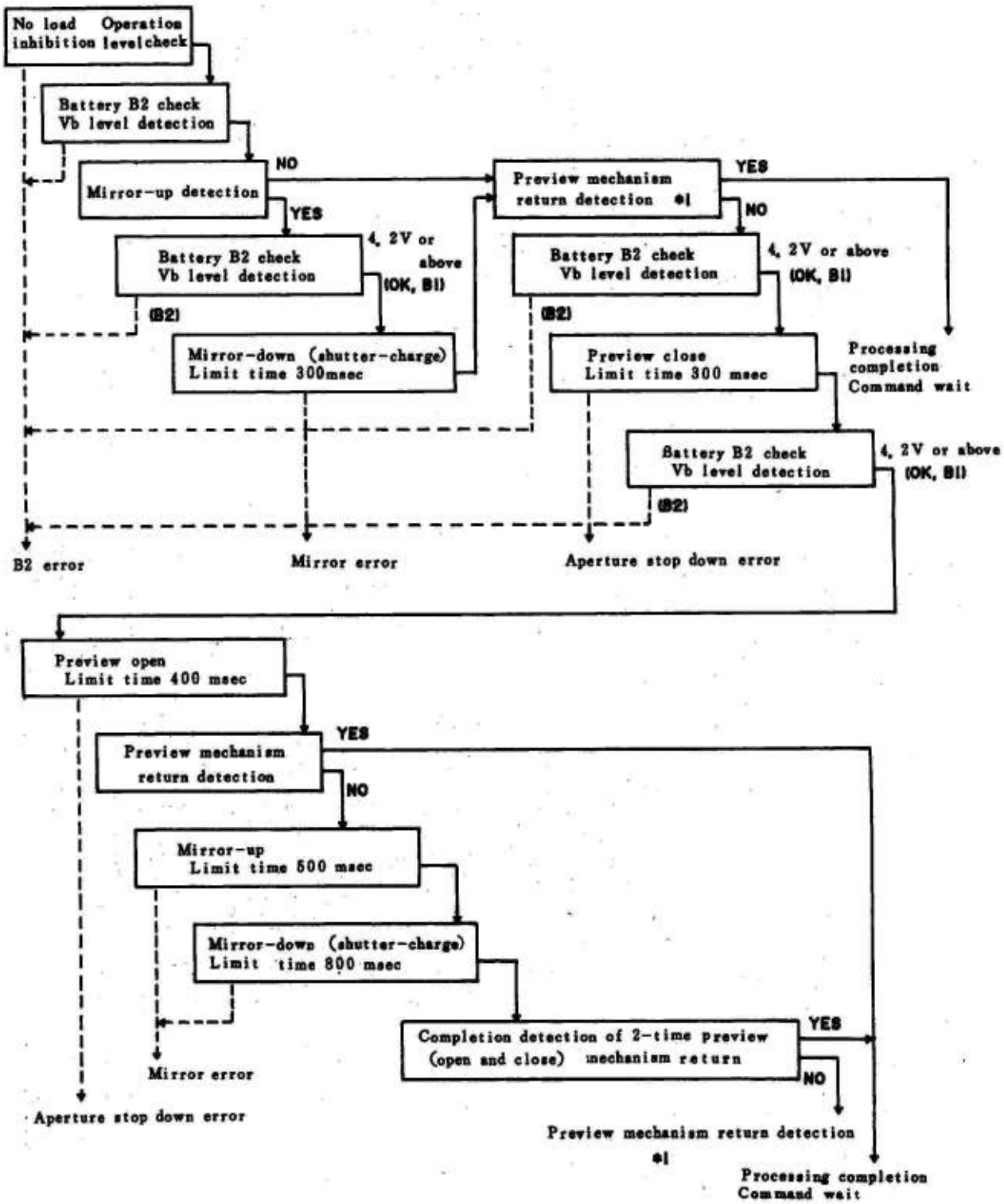
Mech. Initial Error Processing



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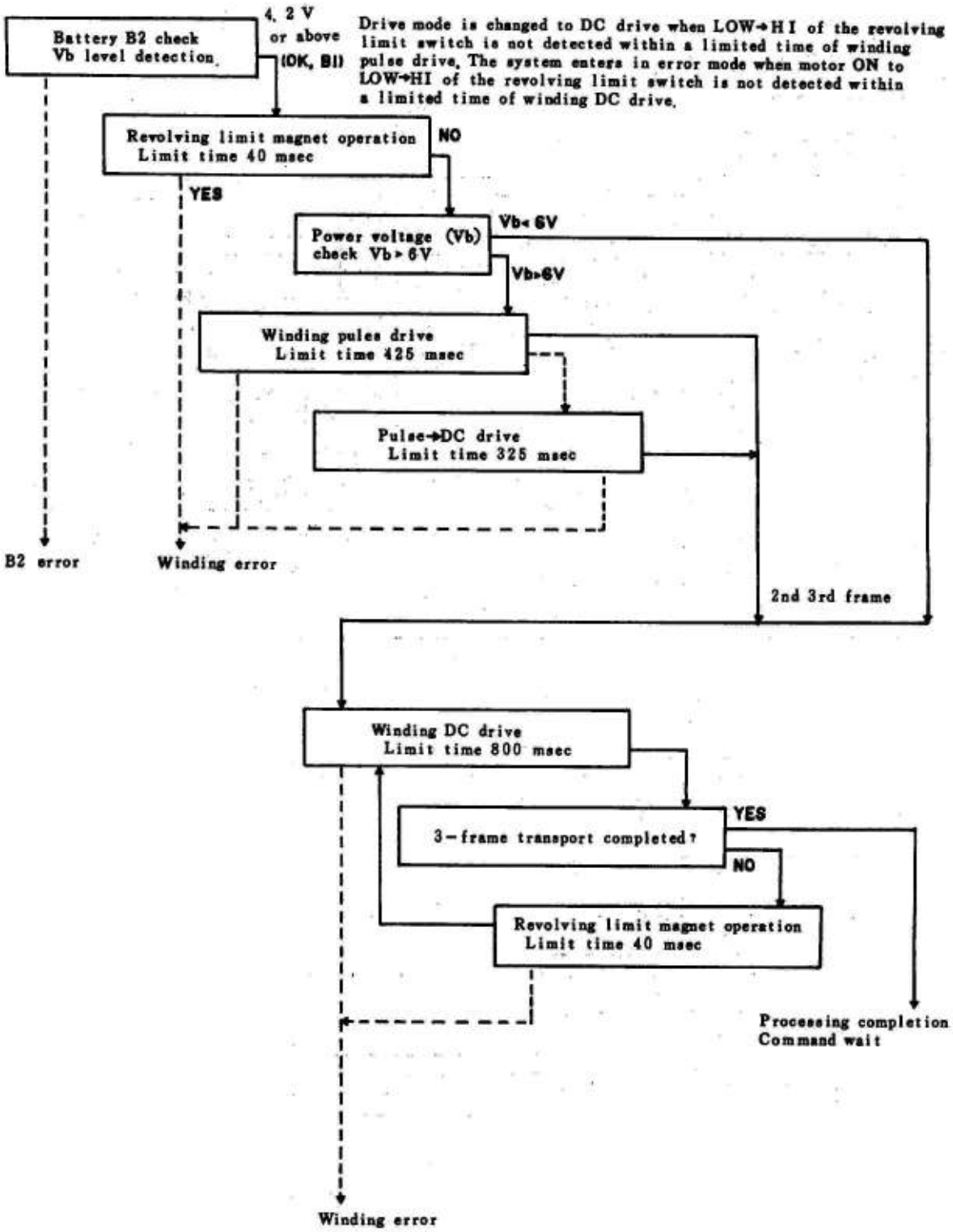
Auto Loading Error processing


Battery B2 check
Vb level detection
4. 2 V
or above
(OK, BI)
Drive mode is changed to DC drive when LOW→HI of the revolving limit switch is not detected within a limited time of winding pulse drive. The system enters in error mode when motor ON to LOW→HI of the revolving limit switch is not detected within a limited time of winding DC drive.
Revolving limit magnet operation
Limit time 40 msec
NO
YES
Power voltage (Vb)
check Vb > 6V
Vb< 6V
Vb>6V
Winding pules drive
Limit time 425 msec
Pulse→DC drive
Limit time 325 msec
B2 error
Winding error
2nd 3rd frame
Winding DC drive
Limit time 800 msec
3-frame transport completed?
YES
NO
Revolving limit magnet operation
Limit time 40 msec
Processing completion
Command wait
Winding error

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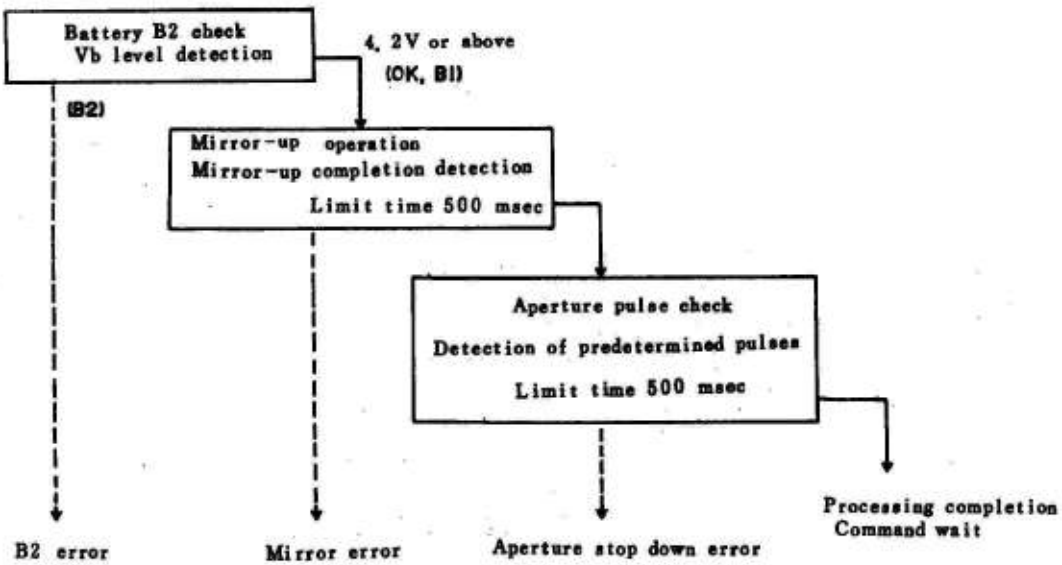
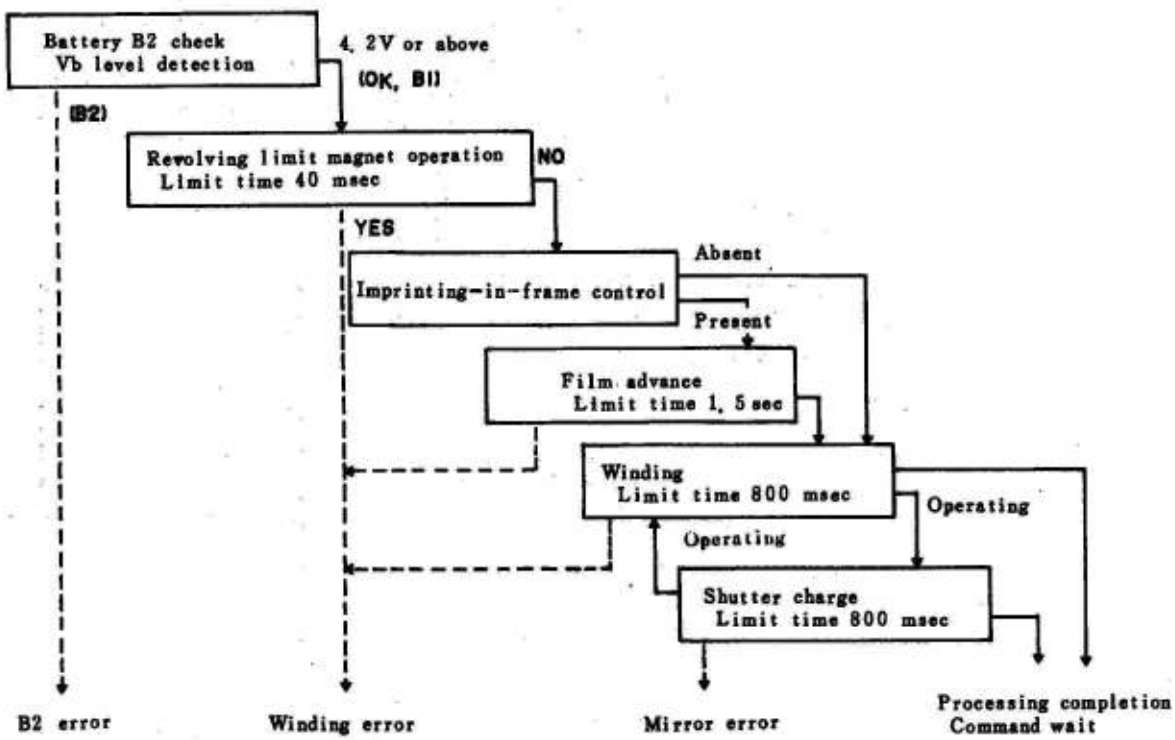
Mirror-up Error Processing



Winding High-speed (CH) Error Processing



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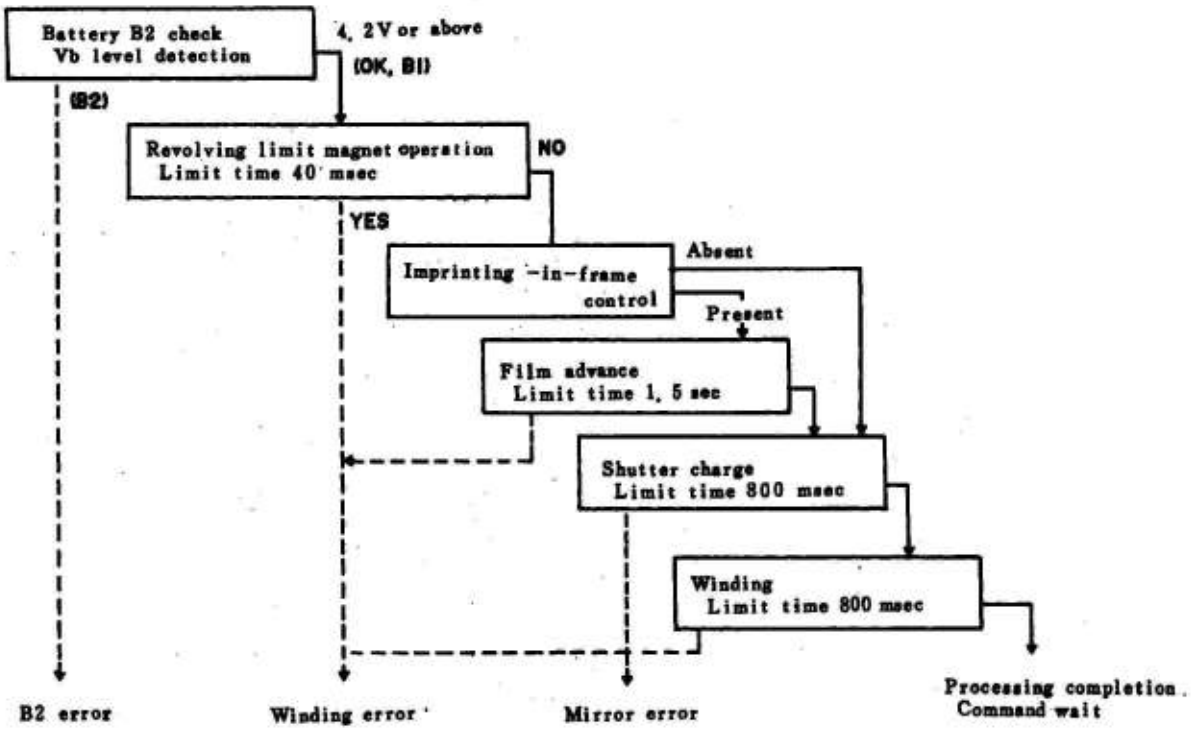
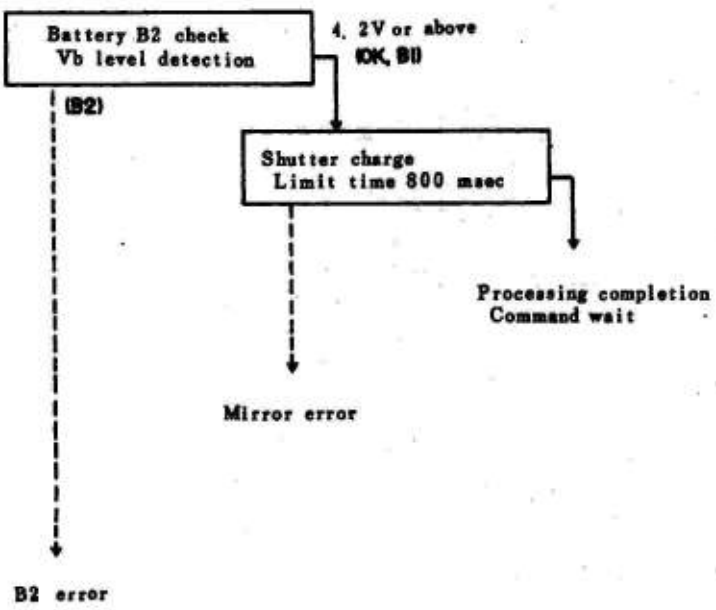
Winding Low-speed (CL) Error Processing



Error Processing for Shutter Charge (Mirror-doun)



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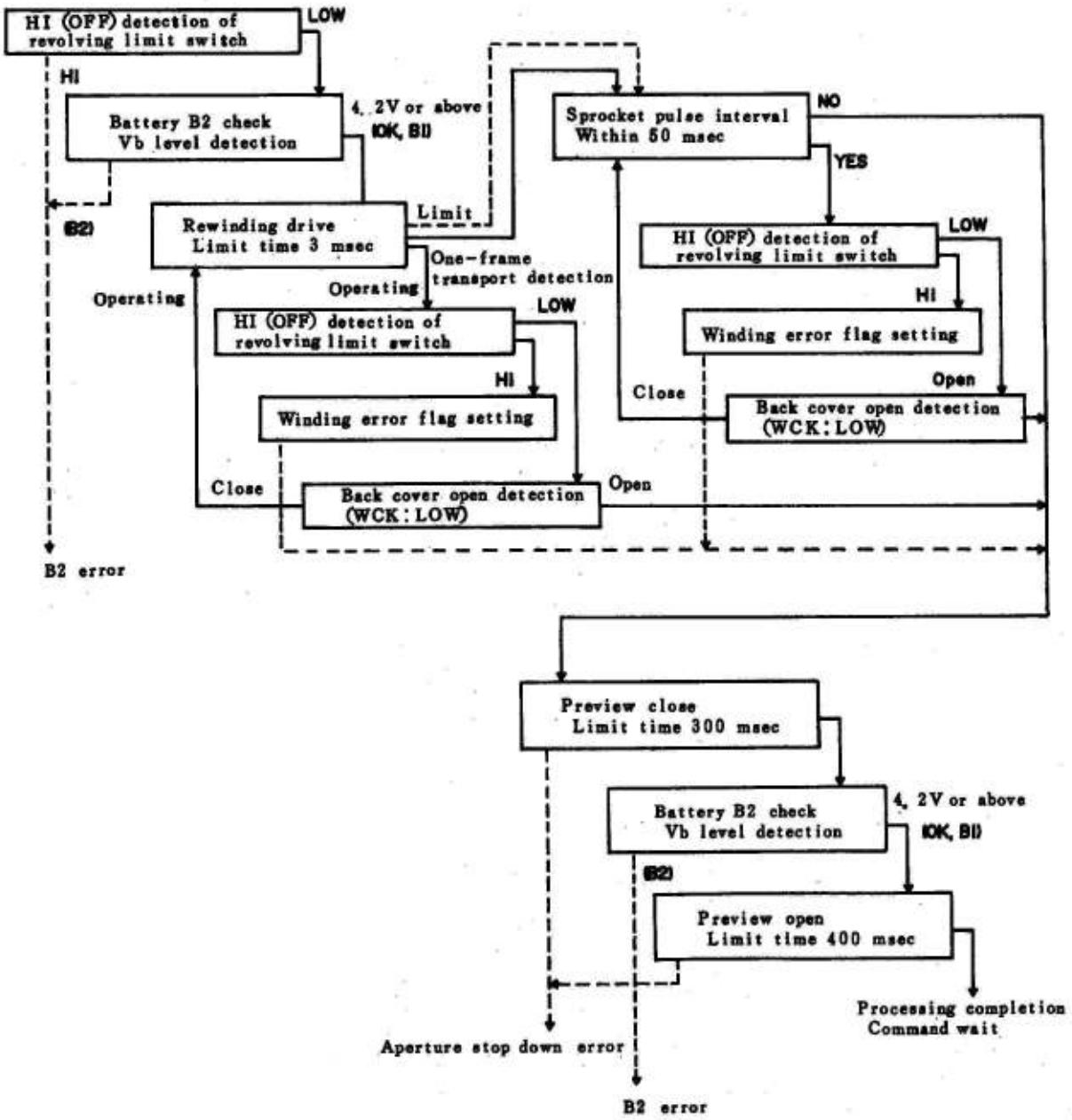
Rewinding Error Processing



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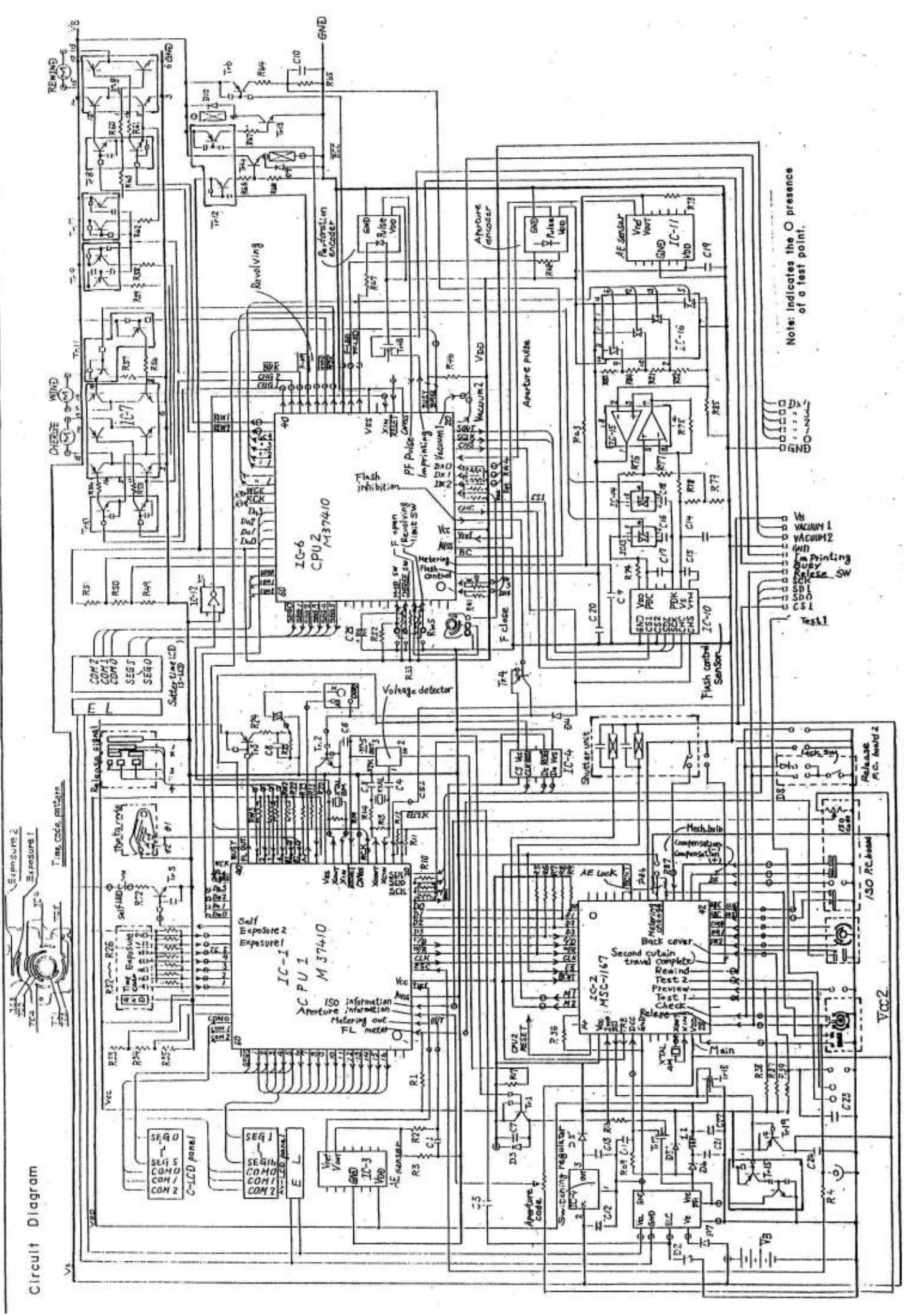

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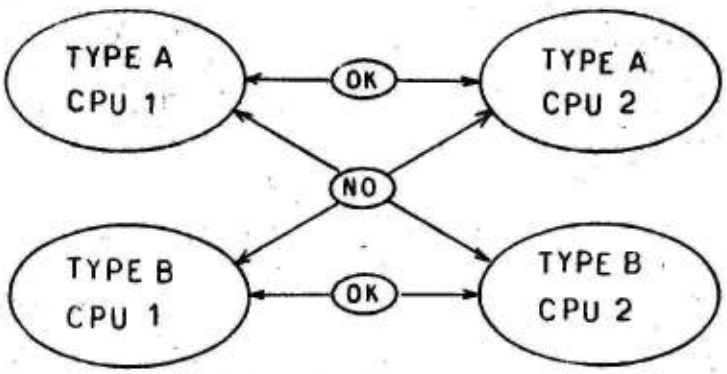
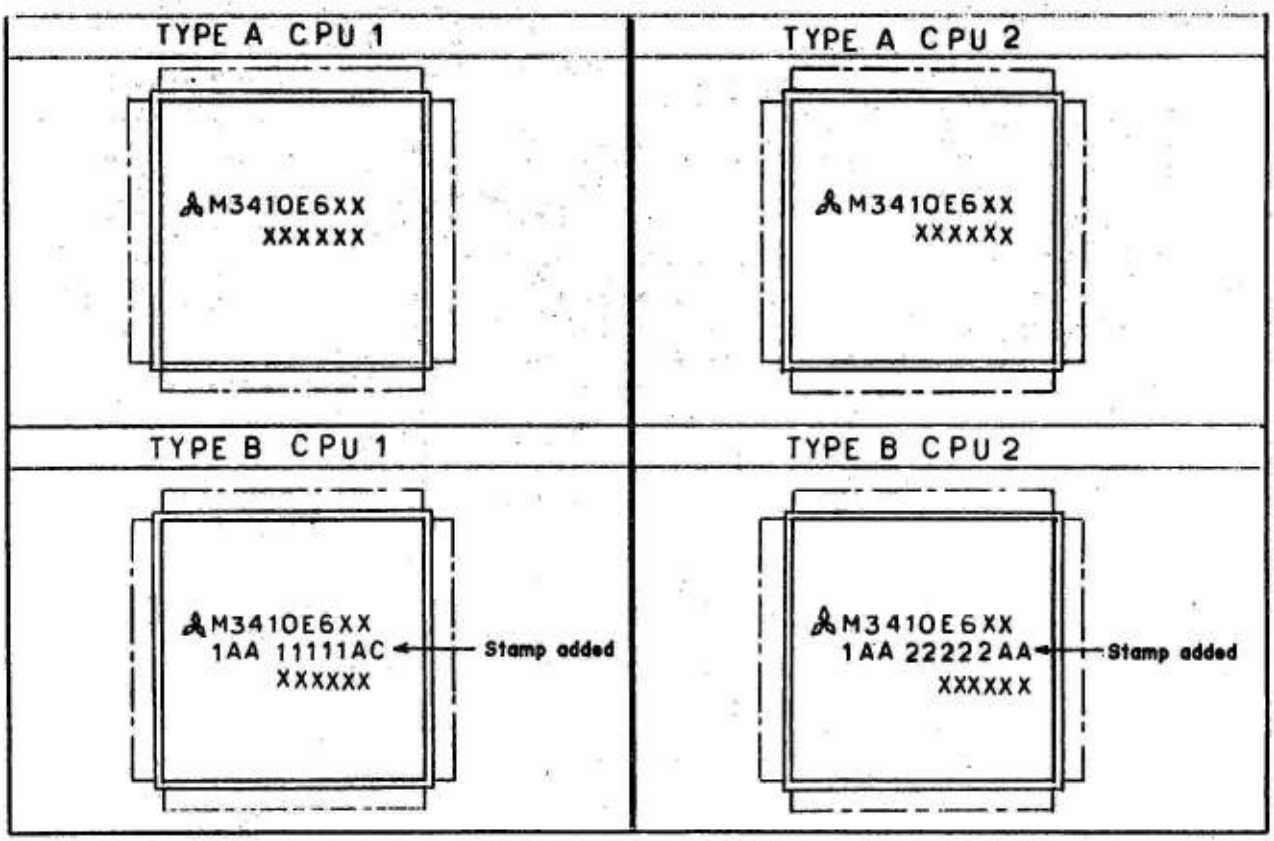
Changed Parts List

☐ Each of the CPU1 (on the Main FPC Ass'y) and CPU2 (on the Sub FPC Ass'y) has been produced in two types.
The CPU1 and CPU2 of type A are used in initial lots of the cameras.
Type A and type B are not interchangeable. In addition, no CPU1 or CPU2 devices of type A are in stock. Therefore, when the CPU1 or CPU2 of type A is found defective, replace the Main FPC Ass'y and Sub FPC Ass'y with those of type B at the same time.





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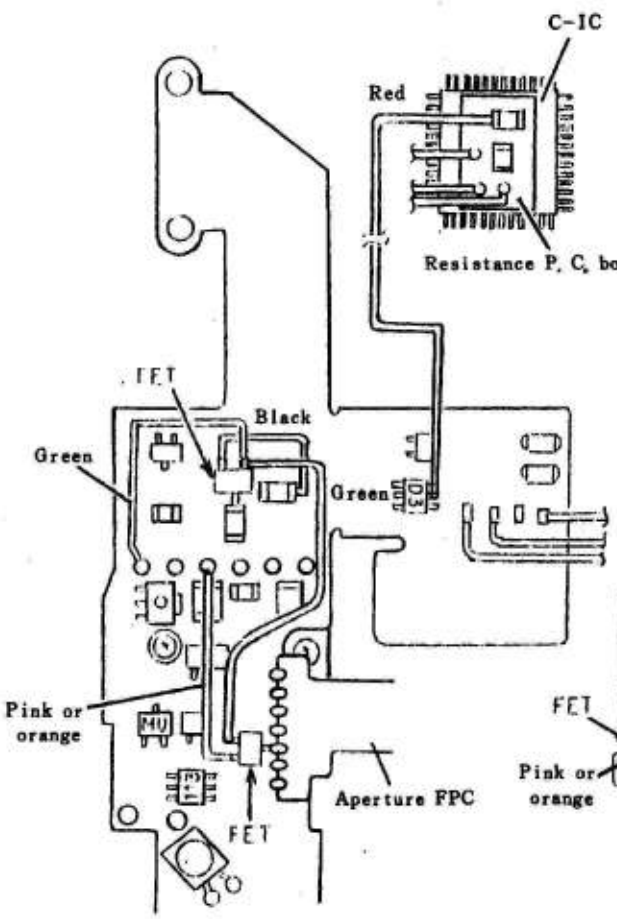
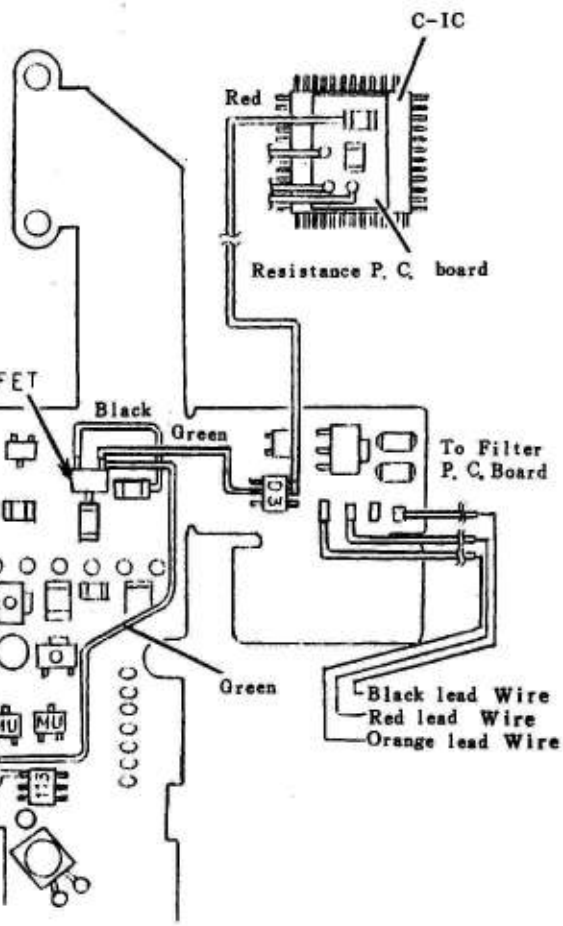
□ FFT was added in the course of production. Therefore, note that the cameras have two different types of wiring. The two types of circuits are interchangeable. This provisional wiring will be abolished in the future.

(Type A)



(Type B)



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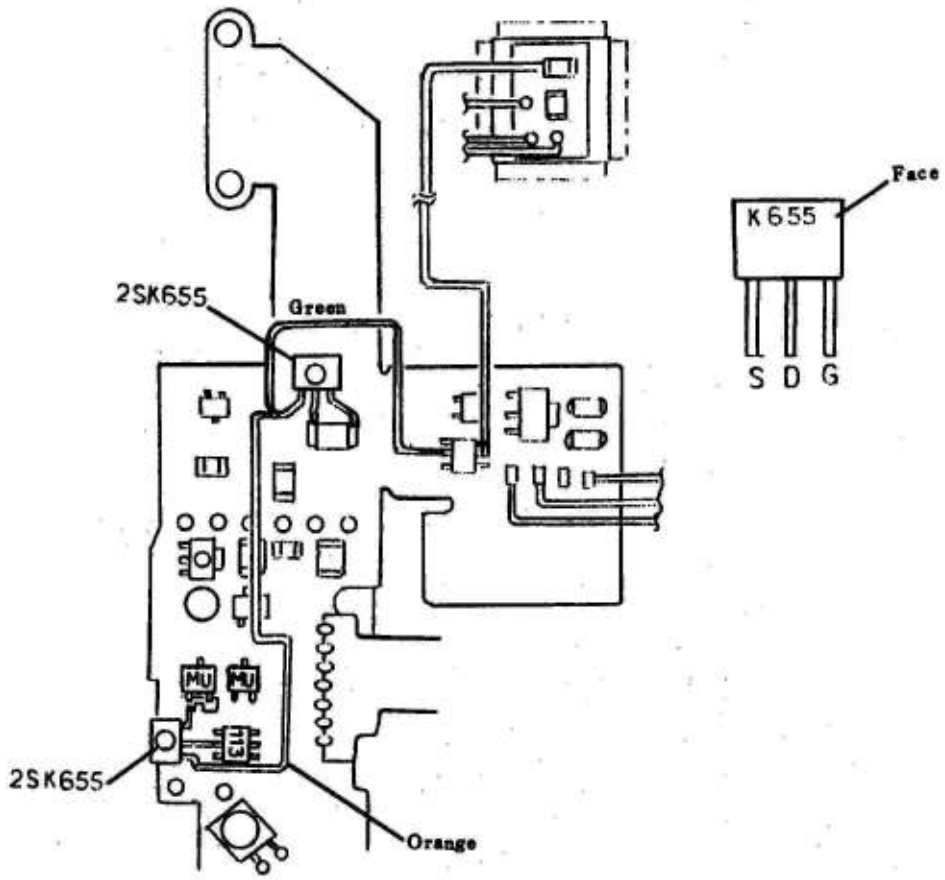
☐ Note that the cameras have two types of FET, namely, the chip type 25K620 and the leg type 2SK655. Observe the same instruction as on the previous page.



Note : Solder each of the two parts (FET 2SK655) so that its back can be seen.

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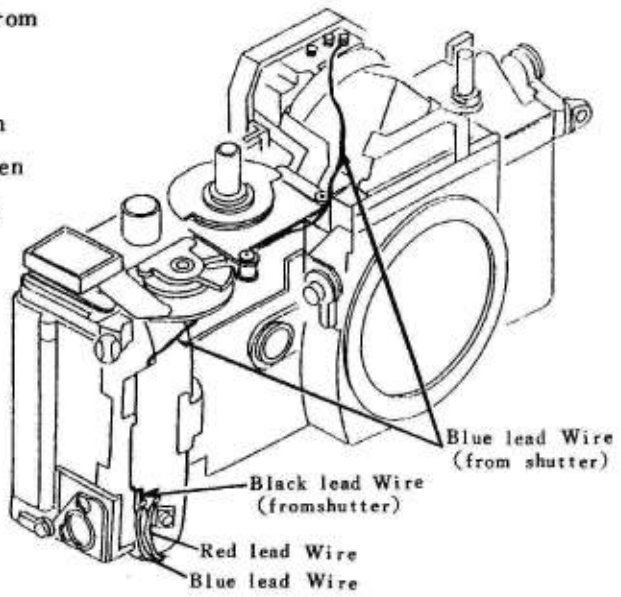
□ In the course of production, the wiring and forming of the black and blue leads from the shutter was changed.

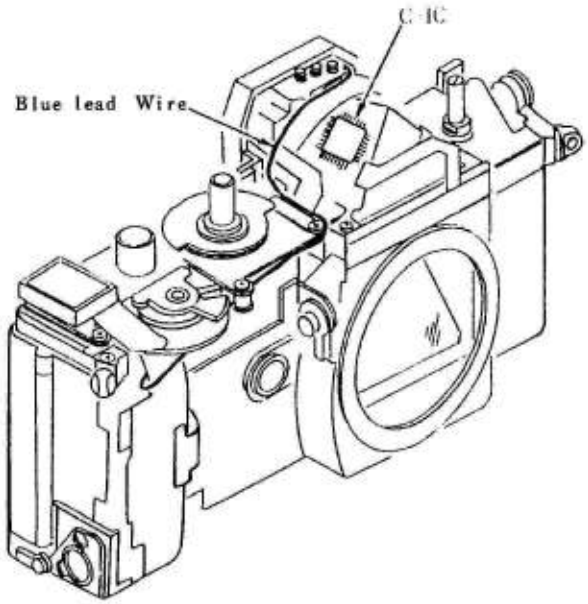
Reason : The camera made an error operation when is was used with a highvoltage flash made by another manufacturer.



〔Modification〕

(1) Black lead wires (from Shutter) is discontinued.

(2) Forming of Blue lead wire (from Shutter) is modified and the Blue lead wire must be away from the C-IC.



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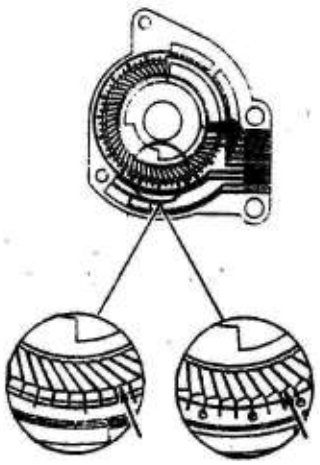
☐ Pattern modify of ISO P.C. Board

In the course of production, the pattern on the ISO P.C. Board was modified. The old type and the new type of the parts listed below are not interchangeable. Therefore, when any of the parts is found defective, replace all the parts at the same time.
Since no old type parts are in stock, replace the old parts, when found defective, with the new type parts. Note that there is no difference in appearance between the old type and the new type of the ISO Name Plate Ass' y, ISO Lock Plate Ass' y and ISO Brush Plate Ass' y.

Part Name	Change	
ISO Name Plate Ass' y (1AAAA030)	Position of ISO numerals of ISO Name Plate is modified by 6 degrees.	
ISO Lock Plate Ass' y (1AAAA420)	Position of teeth on Periphery is modified by 6 degrees.	
ISO Brush Plate Ass' y (1AAAA410)	Contact is modified.	
ISO P.C. Board (1AA56300)	Pattern is modified.	

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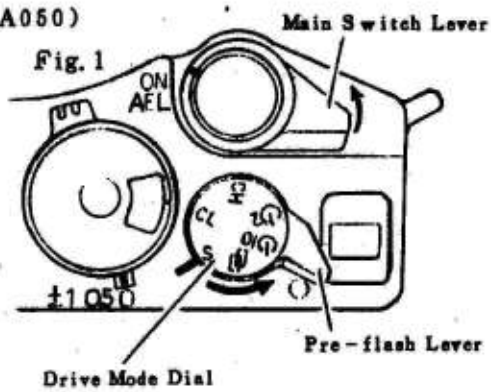
B. Disassembling Procedure

B-1 Disassembly of Exterior Parts

〔Note on removal/installation of Top Cover Ass' y〕

Turn the Pre-flash Lever and Main Switch Lever in the direcitn of the arrow to remove/install the Top Cover Ass' y (1AAAA050)
Do not remove/install the Top Cover Ass' y with the Pre-flash Lever in the OFF position, or the Flash Meter Contact will bend.

Fig. 1



B-1-1 Removal of Top Cover Ass' y

1. Set the Drive Mode Dial (1AA27310) to the "S" position. Loosen the Drive Mode Dial Setscrews (66001136) × 2, and take off the Drive Mode Dial.
2. Remove the Exp. Compensation Dress Plate (1AA21010) by sticking it in the center with tweezers.
   * The Exp. Compensation Dress Plate is pasted on the Exp. Compensation Name Plate Setscrew.
3. Remove the Exp. Compensation Name Plate Setscrew (1AA20920). and remove the Exp. Name Plate Ass' y (1AAAA020), ISO Name Plate Base Spring (1AA70800) and ISO Dial Ass' y (1AAAC180).
4. Remove the Dioptric Adjustment Knob Plate (1AA85630) by sticking it in the center with the tweezers.
   * The Dioptric Adjustment Knob Plate is fixed on the Dioptric Adjustment Setscrew with double adhesive tape.
5. Remove the Dioptric Adjustment Knob Setscrew (66001137) while holding down the Dioptric Adjustment Knob (1AA85220). The remove the Dioptric Adjustment Knob.
6. Remove the Shutter Dial Cover (1AA97510)
   * Shutter Dial Cover is pasted on the Shutter Dial.
7. Remove the Shutter Dial Setscrews (61815026) × 3, and take off the Shutter Dial (1AA97320).
8. Remove the S, Lock Button Ass' y (1AAAA040) and Shutter Lock Spring (1AA97200).

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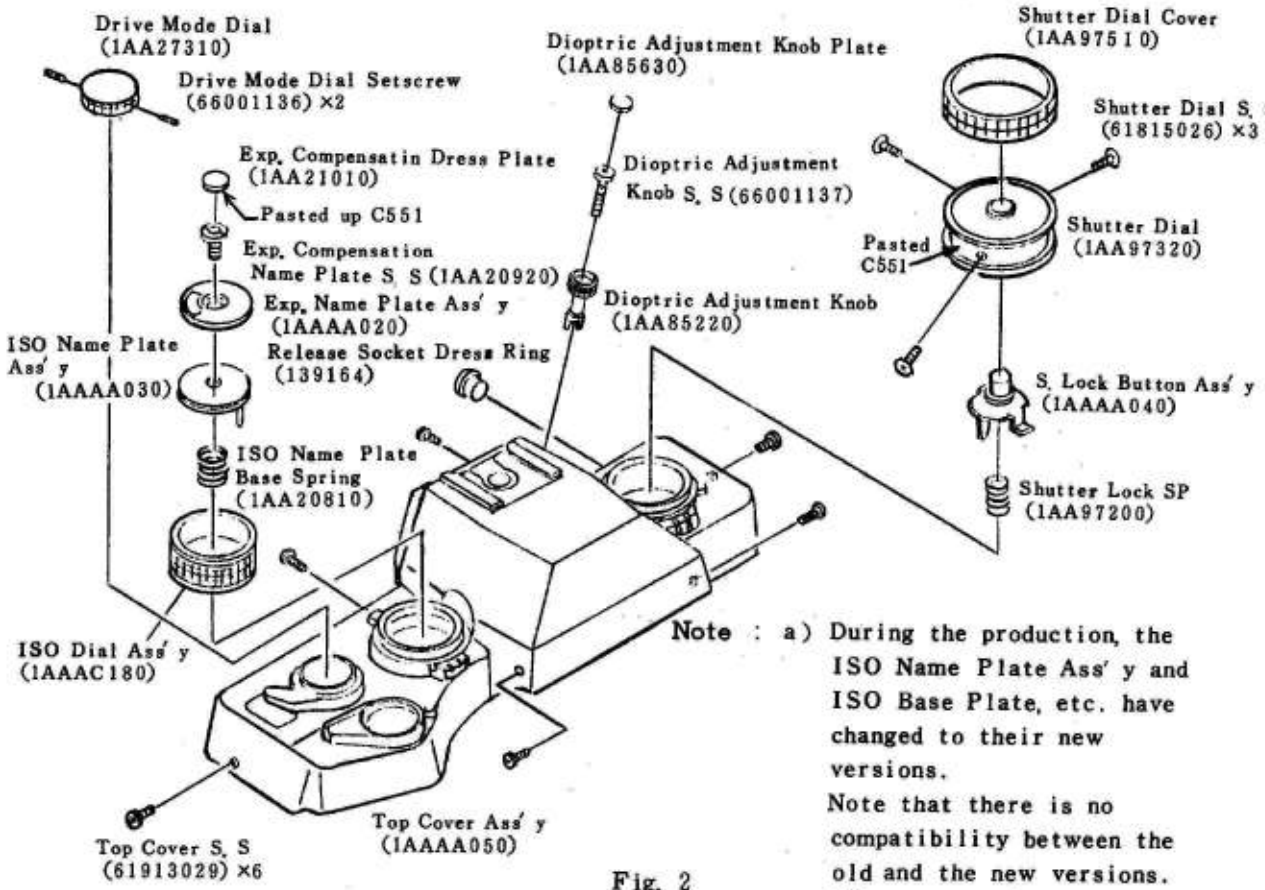

Fig. 2

Note : a) During the production, the ISO Name Plate Ass' y and ISO Base Plate, etc. have changed to their new versions.
Note that there is no compatibility between the old and the new versions.
(See page 5).

9. Remove the Release Socket Dress Ring (139164).
10. Remove the Top Cover Setscrews (61913029) × 6.
11. Remove the Top Cover Ass' y (1AAAA050) by lifting it up. Unsolder the black lead wire on the time cord board.

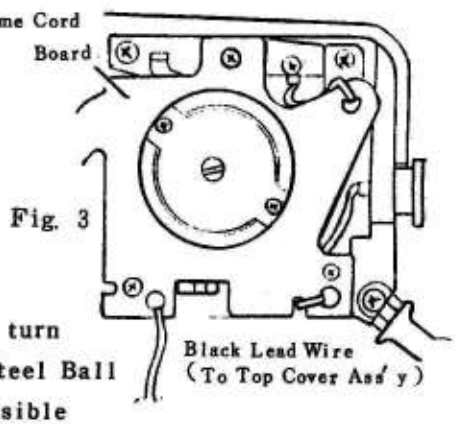

Fig. 3

〔Caution after removing Top Cover Ass' y〕

a) After removing the Top Cover Ass' y, never try to turn the Mode Dial beyond the click. Otherwise, the Steel Ball (Ø 1.5)(66701520) may fall off, resulting in a possible loss of the part.

〔Caution when mounting Top Cover Ass' y〕

a) The Top Cover is a magnesium die casting, which is of a relatively brittle material. Care must be taken therefore when screwing (Do not overtightening) the once-removed Cover on.

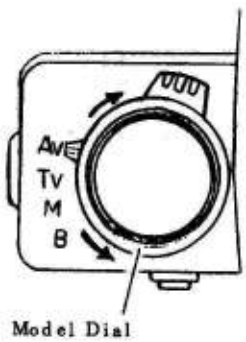

Fig. 4

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B-1-2 Removal of Cell Case Ass' y

1. Raise the Battery Compartment Cover Release Knob (26011800), turn it (marked with "●") in the direction of the arrow, and remove the Bottom Cover Ass' y (1AAAA010) (Ⓒ⇨Ⓔ)
2. Remove the Front Cover Setscrew (61813029) ×4, and then remove the Front Cover (1AA70020) by holding it at both sides Ⓐ and raising it horizontally.

Note : When the Top cover Ass' y has been removed, remove the Front Cover also. Installing the Top Cover Ass' y without removing the Top Cover will damage the Front Light-Proof Curtain (1AA74900).

3. Remove the Cell Case Cover (L) Setscrews (69214579)x 2 and take off the Cell Case Cover (L) (1AA12310) and the Cell Case Contact (2) (1AA12510).
4. Peel off the Front Plate Rubber (right) (1AA13900) and the Front Plate Rubber (left) (1AA14110).

Note : a) The Front Plate Rubber (right) and the Front Plate Rubber (left) are glued to the Front Plate with double adhesive tape.

b) The double adhesive tapes, once removed from the Front Plate Rubber (right) and Front Plate Rubber (left), must be replaced with new tapes, for they lose the adhesive power.

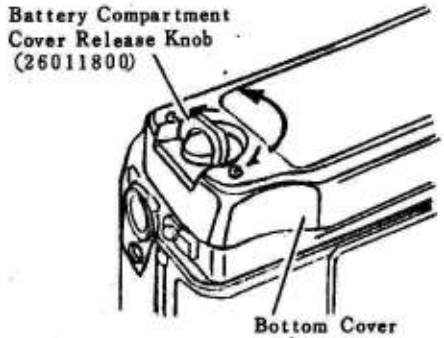

Fig. 5

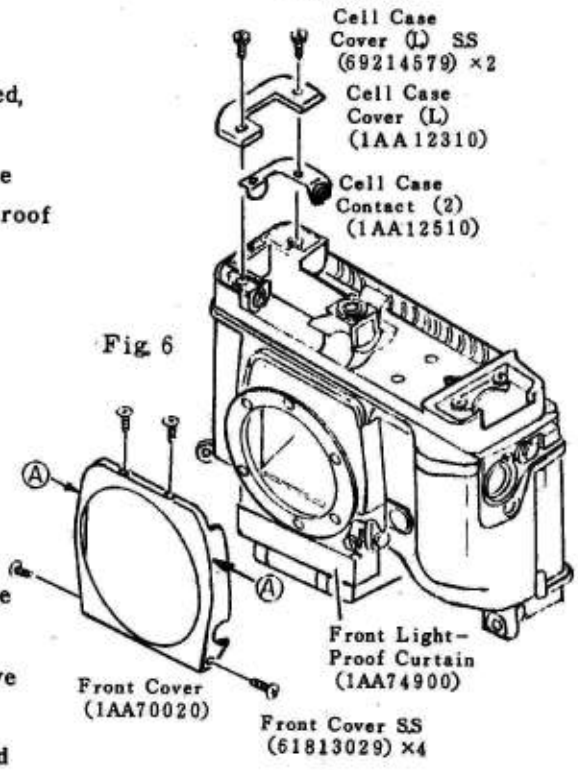

Fig. 6

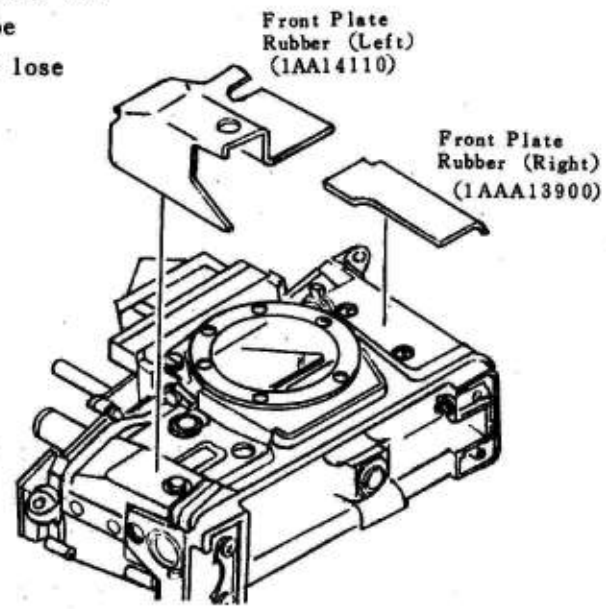

Fig 7

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5. Remove the Back Cover Lock Cover Setscrews (63917029) ×2 and take off the Back Cover Lock Cover (1AA17000).

6. Remove the Front Plate (right) Setscrews (61926026) ×2 and take off the Front Plate (right) (1AA13800).

7. Remove the Front Plate (left) Setscrews (16927026) ×2 and (61924026) ×2 and take off the Front Plate (left) (1AA14010).

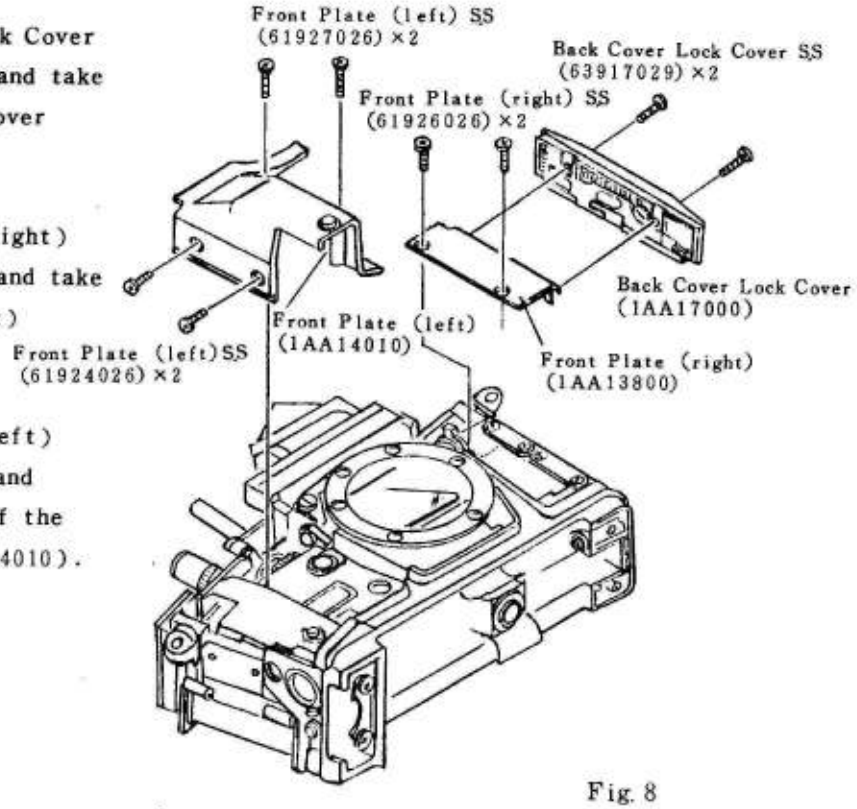

Fig. 8

8. Remove the Cell Case Setscrews (61927026) ×4 and (61925026) ×3 and take off the Cell Case (1AA12020).

9. Unsolder the Red and Blue Lead Wires on the Sub FPC.

10. Remove the Tripod Screw Base Setscrews (61825026) ×2 and take off the Tripod Screw Base (1AA10410).

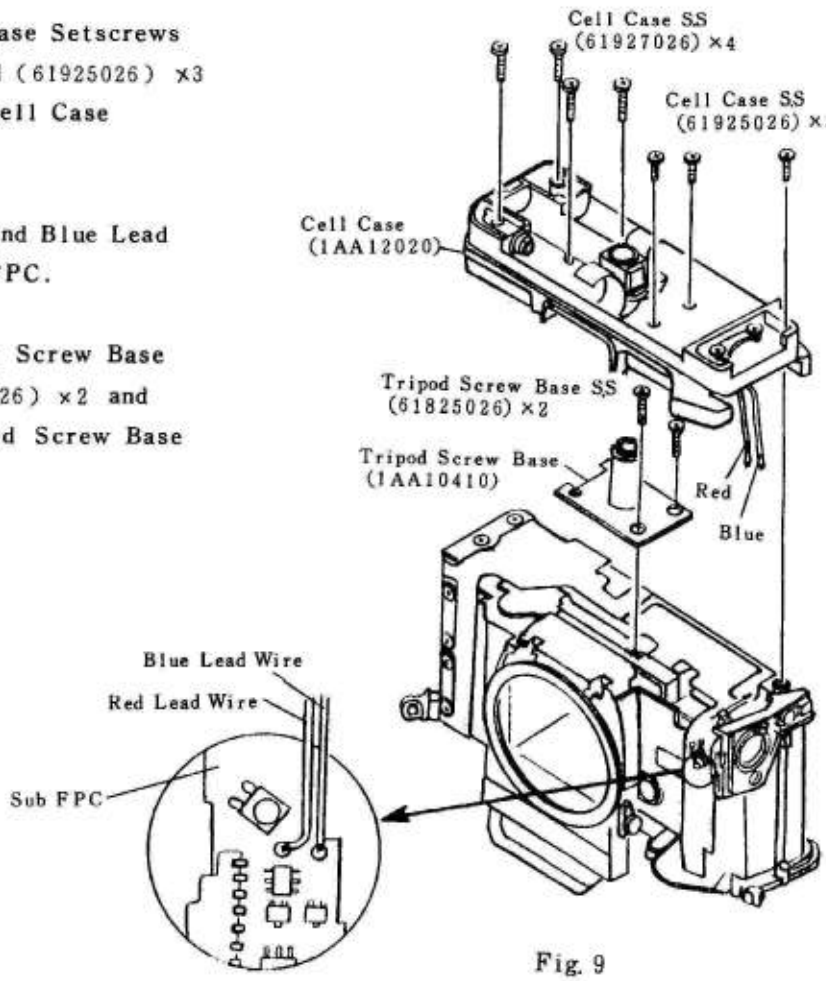

Fig. 9

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B-2. Disassembly of Main FPC Ass' y

B-2-1 Removal of S. Dial Base

1. Remove the S. Click Plate Setscrews (61902526) x2 and take off the S. Click Plate (1AA96200).
2. Remove the S. Dial Click Setscrew (1AA96000) and take off the S. Click Spring Plate (1AA96300) and the Steel Ball (Ø15) (66701520).
3. Remove the S. Click Pin (1AA96100), S. Click Spring (1AA95900) and the S. Click (1AA95800).
4. Remove the S. Dial Base (1AA95610)

Note : a) Take care not to lose the Steel Ball (66701520).
b) Take care not to deform the S. Dial Contact while repairing.
c) Clean the S. Dial Contact and the Time Code Pattern area with ether alcohol or the like before assembling.
d) Removal of the S. Dial Click Setscrew (1AA96000) will also result in the removal of the S. Dial Click (1AA95800), S. Dial Click (1AA95810) and S. Click (1AA95800) in the S. Dial Base (1AA95610).

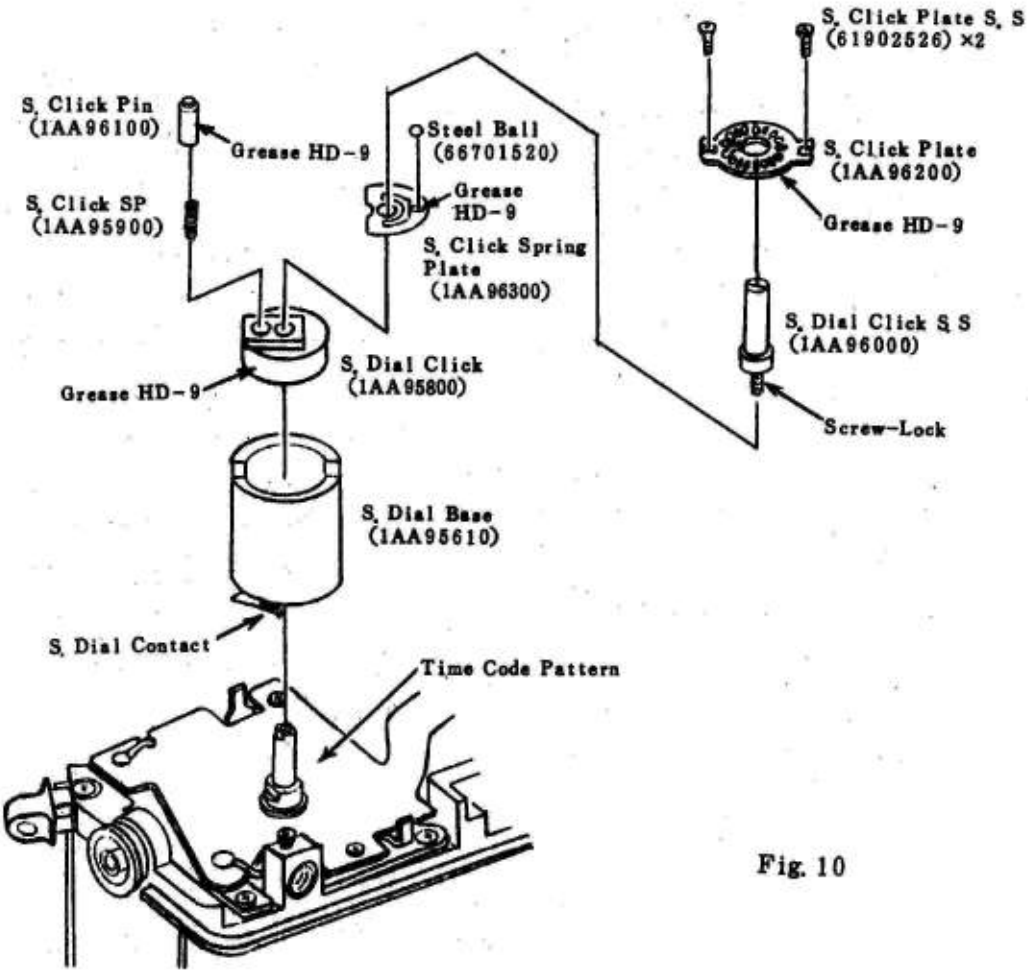

Fig. 10

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B-2-2. Removal of ISO Dial Base Plate Ass' y

1. Loosen the ISO Connector Plate Setscrews (66001076) ×2 and take off the ISO Connector Plate (1AA58000) and the ISO Connector Rubber (1AA57900).
2. Remove the Connector of the Main FPC.
3. Remove the ISO Dial Base Plate Setscrews (63924026) ×3 and moving off the ISO Dial Base Plate Ass' y in the direction of the arrow.

Note : a) Clean the Connector Parts Pattern with ether alcohol or the like before installing the Connector.

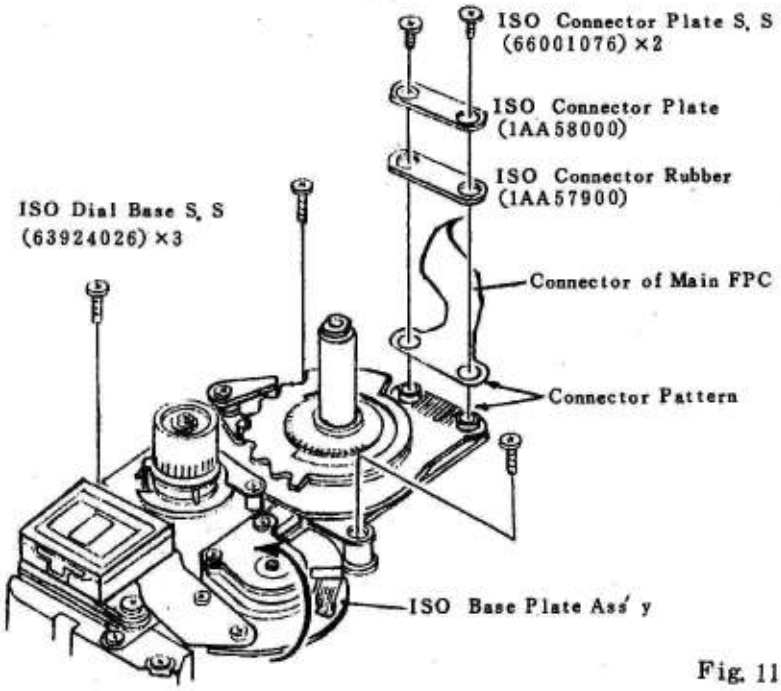

Fig. 11

4. Remove the FPC Connector Plate (2) Setscrew (66001076)×2 and take off the FPC Connector Plate (2) (1AA58200) and the FPC Connector (2) (1AA58400).
5. Remove the ISO Dial Base Plate Ass' y.
6. Take off the part Ⓐ of the Main FPC Connector, the part Ⓑ of the Sub FPC Connector and the part Ⓒ of the Main FPC Connector.
7. Unsolder the Blue Lead Wire (to the Shutter X Contact) on the Shoe Contact.
8. Unsolder the Red Lead Wire (VDD) on the Resistor P.C Board. (See Fig. 12.)

Note : a) The Resistor P.C Board currently used will not be used in the futer. (See Page B-11)

b) Clean the connector pattern with ether alcohol or the like before installing the FPC Connector.

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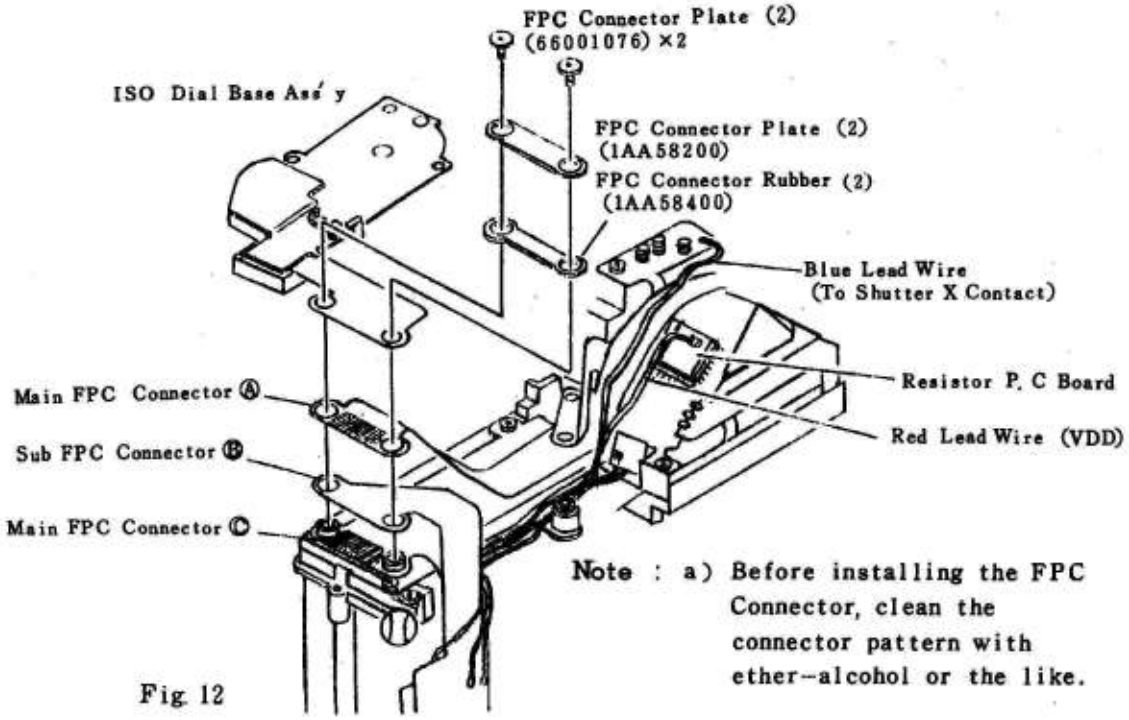

Note : a) Before installing the FPC Connector, clean the connector pattern with ether-alcohol or the like.

Fig. 12

B-2-3. Removal of the DC-DC Convertor

1. Unsolder the Lead Wires on the Sub FPC.
   - ① Unsolder the Light Blue Lead Wire (to the S Charge Switch).
   - ② Unsolder the Red and Black Lead Wires (to the Winding Motor).
   - ③ Unsolder the Yellow Lead Wire (S-EL and Aperture EL relay).
   - ④ Unsolder the Black Lead Wire (to the Shutter).
   - ⑤ Unsolder the soldered joints of Aperture FPC (7 location)
   - ⑥ Unsolder the soldered joints of DC-DC Converter (6 and 2 location).

   * Use of the Black Lead Wire connected from the Shutter was abandoned during the production.

2. Turn the Sub FPC in the direction of the arrow.

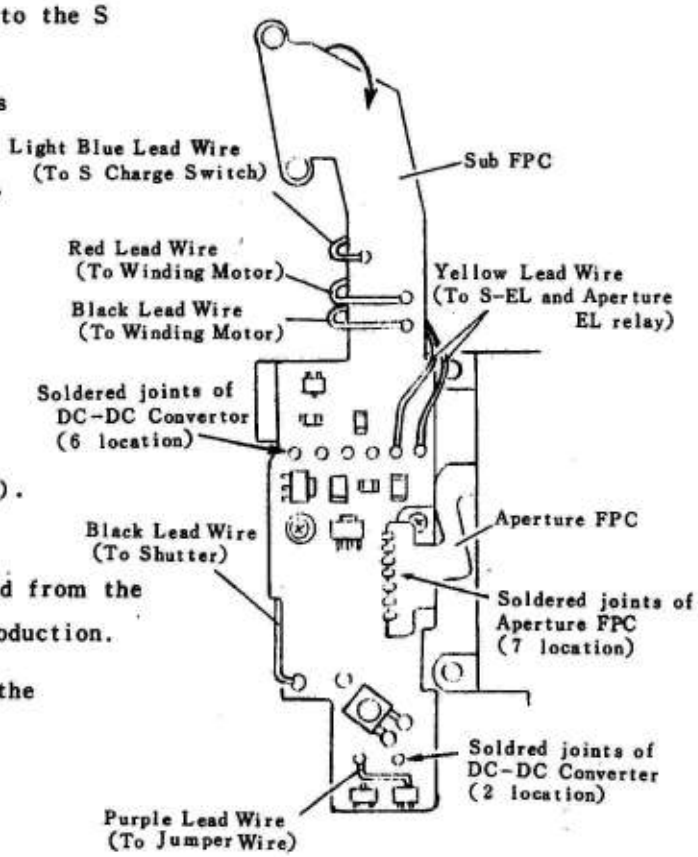

Fig. 13

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3. Remove the DC–DC Convertor Setscrews (61912526, 69213076) and take off the DC–DC Convertor (1AA52010).
4. Peel off the acetate cloth tape.
5. Remove the FPC Connector Plate (1) Setscrews (66001041) ×2 and take off the FPC Connector Plate (1) (1AA58100) and the FPC Connector Rubber (1) (1AA58300).
6. The Connector Post (2) (1AA58610) is disconnected by removing the Connector Portion of Main FPC, the Connector Portion of Shutter FPC and the Shutter Insulation Sheet (1AA59900).

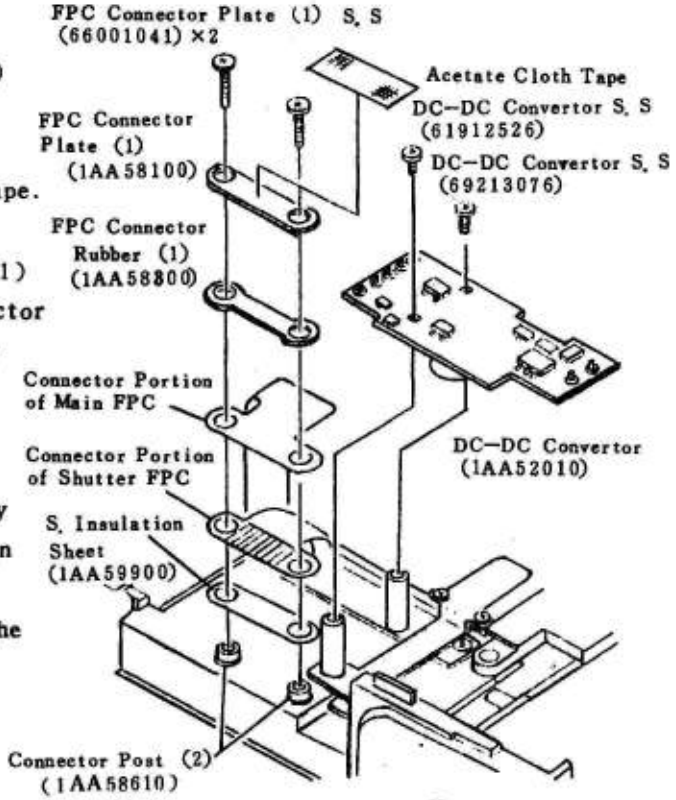

FPC Connector Plate (1) S. S (66001041) ×2
Acetate Cloth Tape
DC–DC Convertor S. S (61912526)
DC–DC Convertor S. S (69213076)
FPC Connector Plate (1) (1AA58100)
FPC Connector Rubber (1) (1AA58800)
Connector Portion of Main FPC
Connector Portion of Shutter FPC
DC–DC Convertor (1AA52010)
S. Insulation Sheet (1AA59900)
Connector Post (2) (1AA58610)

Fig. 14

Note

a) Before installing the FPC Connector Portion, clean the Pattern in the Connector Portion with ether alchol.

b) The Acetate Tape and the Shutter Insulaion Sheet have used only to the first production of about 2, 000 cameras. Attach the Shutter Insulation Sheet and stick the Acetate Cloth Tape to the old typed Shutter FPC, otherwise the Front Plate (Left) (1AA14010) and the Shutter FPC will be short–circuited.

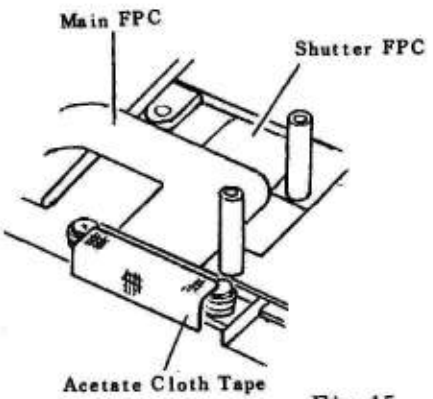
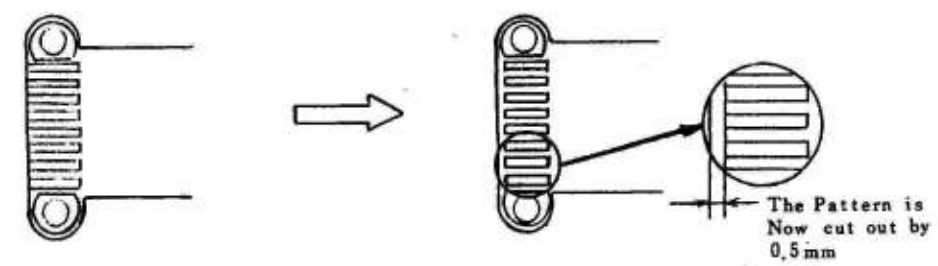


Fig. 15



Old version of shutter FPC

New Version of Shutter FPC

Fig. 16

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B-2-4. Removal of the Dial Base Plate Ass' y

1. Unsolder the lead wires on the Main FPC.
   ① Unsolder the Blue Lead Wire (Synchro).
   ② Unsolder the Gray Lead Wire (GND).
   ③ Unsolder the Blue Lead Wire (Synchro Socket).
   ④ Unsolder the Green Lead Wire (R Socket).
2. Remove the Eyepiece Ass' y Setscrew (63914026) and take off the Time Code Retaining Plate (1AA56200).

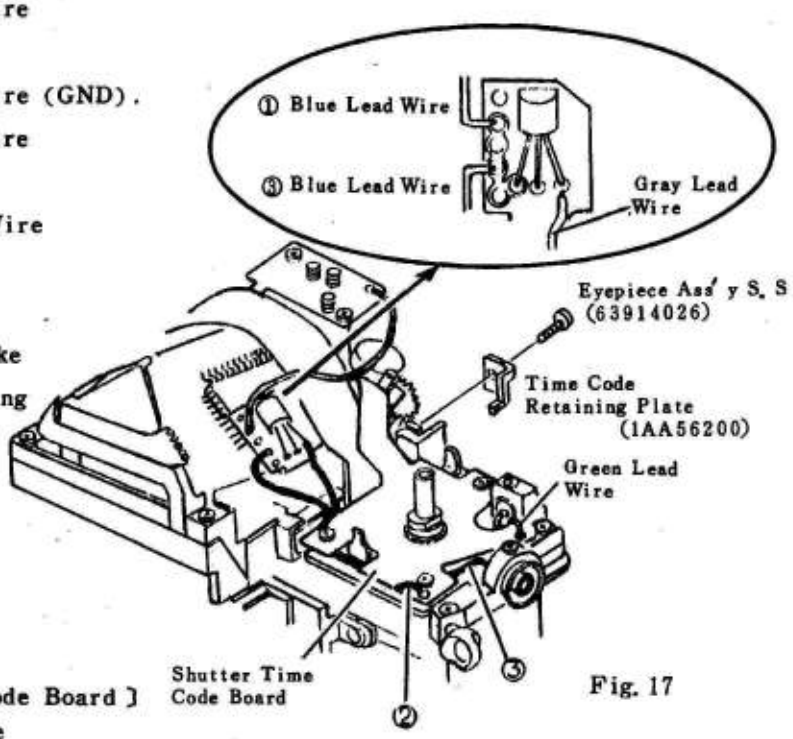

Fig. 17

〔Forming the Lead wires when installing the Shutter Time Code Board〕

a) Pass the follwing through the Shutter Time Code Board: ③ Blue Lead Wire from the Synchro Socket and ② Gray Lead Wire from the Shutter Time Code Board.

3. Remove the Main FPC Setscrews (63902522) ×3.
4. Remove the Shutter Dial Base Plate Setscrews(61813026) ×2, (61913026) and take off the Shutter Dial Base Plate Ass' y.
5. Remove the Rewind Gear (4) (1AA43200).
6. Pull straight up to remove the Rewind Coupling Shaft (1AA43310) (See Fig. 19)

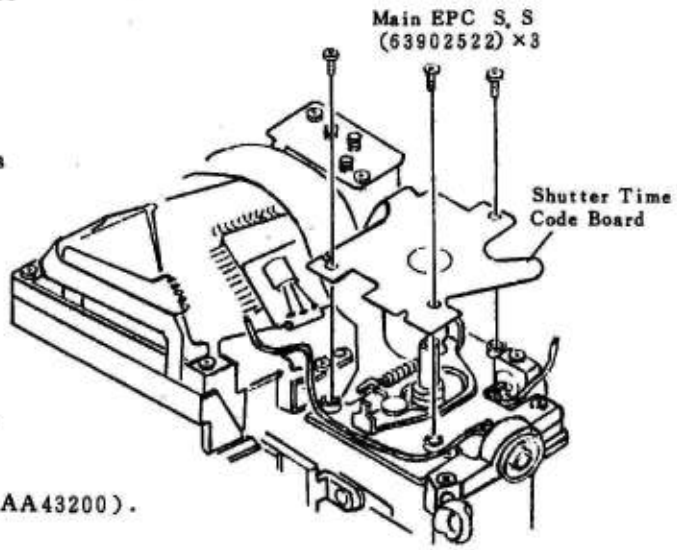

Fig. 18

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〔Caution when Installing Rewind Coupling Shaft〕
(located at right below of the body)

When installing the Rewind Coupling Shaft (1AA43310), engage the D-cut portion of the Rewind Coupling Shaft with the Rewind Gear (4).

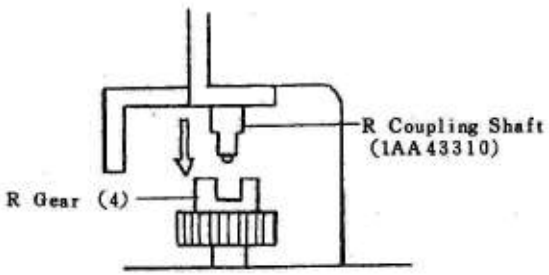

Fig. 20

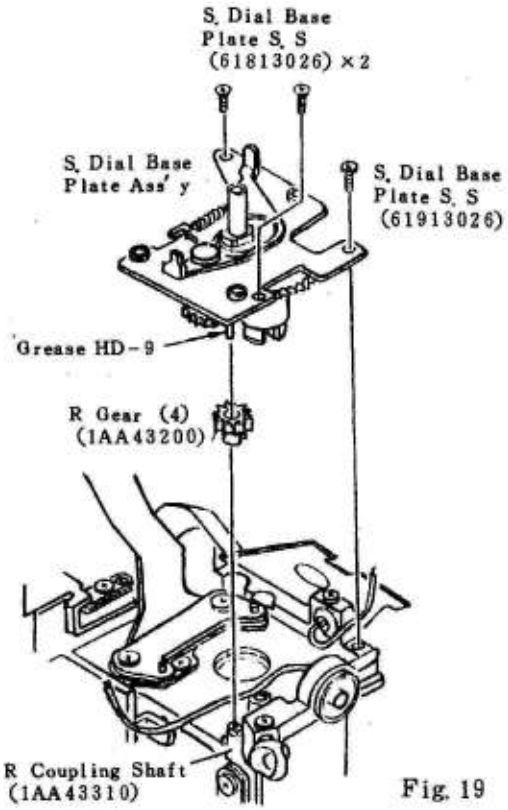
S. Dial Base Plate S. S (61813026) ×2
S. Dial Base Plate Ass' y
S. Dial Base Plate S. S (61913026)
Grease HD-9
R Gear (4) (1AA43200)
R Coupling Shaft (1AA43310)

Fig. 19

〔Caution when installing Rewind Gear (4)〕
(located at right above of the body)

When installing the Rewind Gear (4) (1AA43200), engage the D-cut portion of the Rewind Coupling Shaft.

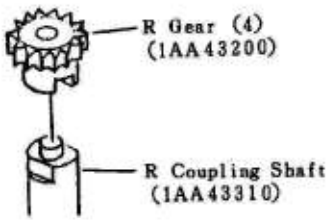

Fig. 21

〔Check after installing the Shutter Dial Base Plate Ass' y〕

After installing the Shutter Dial Base Plate Ass' y to the body, make sure that the Rewind Fork turns with ease with your fingers.

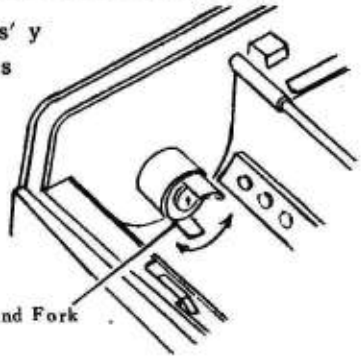

Fig. 22

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B-2-5 Removal of Hain FPC Ass' y

Note : a) From the middle of the production, the use of the Resistor Board was discontinued. Notice that there is a difference in soldering lead wires between camera with the Resistor Board and one without it.ıt it.

〔Wiring diagram with Resistor Board〕

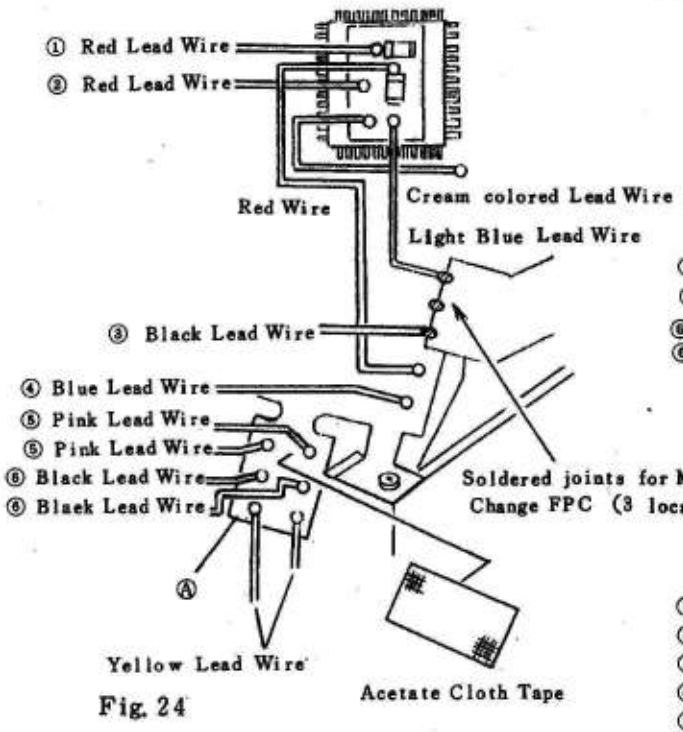

Fig. 24

〔Wiring diagram without Resistor Board〕

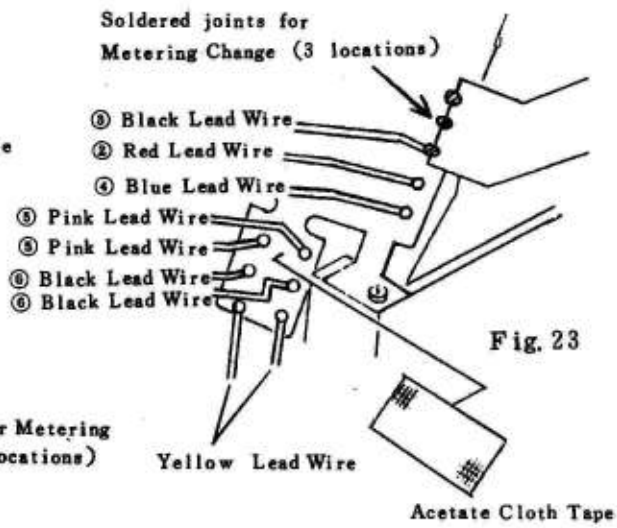
Soldered joints for Metering Change (3 locations)
③ Black Lead Wire
② Red Lead Wire
④ Blue Lead Wire
⑤ Pink Lead Wire
⑤ Pink Lead Wire
⑥ Black Lead Wire
⑥ Black Lead Wire
Yellow Lead Wire
Acetate Cloth Tape

Fig. 23

① Red Lead Wire (from Sub FPC)
② Red Lead Wire (from Aperture Control Board)
③ Black Lead Wire (from Aperture Control Board)
④ Blue Lead Wire (from Aperture Control Board)
⑤ Pink Lead Wire (S-LCD Panel)
⑥ Black Lead Wire (Aperture LCD Panel)

1. Peel off the Acetate Cloth Tape.
2. Unsolder each lead wire of ① through ⑥
3. Unsolder the soldered joints for the Metering Change FPC (3 locations).
4. Unsolder the soldered joints for the Open Signal FPC (5 locations).

Note : a) After soldering the Pink, Black and Yellow Lead Wires, wrap up the FPC portion marked with Ⓐ with Acetate Cloth Tapes in order, not to short-circuit with the Mirror Box and the Top Cover.

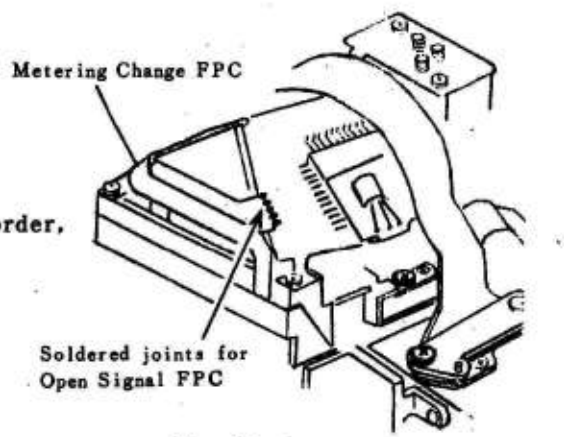

Fig. 25

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5. Remove the Main FPC Setscrews (61913522) × 2.
6. Remove the Accessory Shoe Base Setscrews (61918026) × 2 and take off the Accessory Shoe Base (1AA86800).
7. Remove the FPC Guide Setscrews (66001032) × 2 and take off the FPC Guide (1AA59700) and the FPC Connector Rubber (2) (1AA58200).
8. Remove the Connector portions of the Aperture LCD Panel FPC and the Main FPC, and take off the Main FPC Ass' y (1AAAE000).

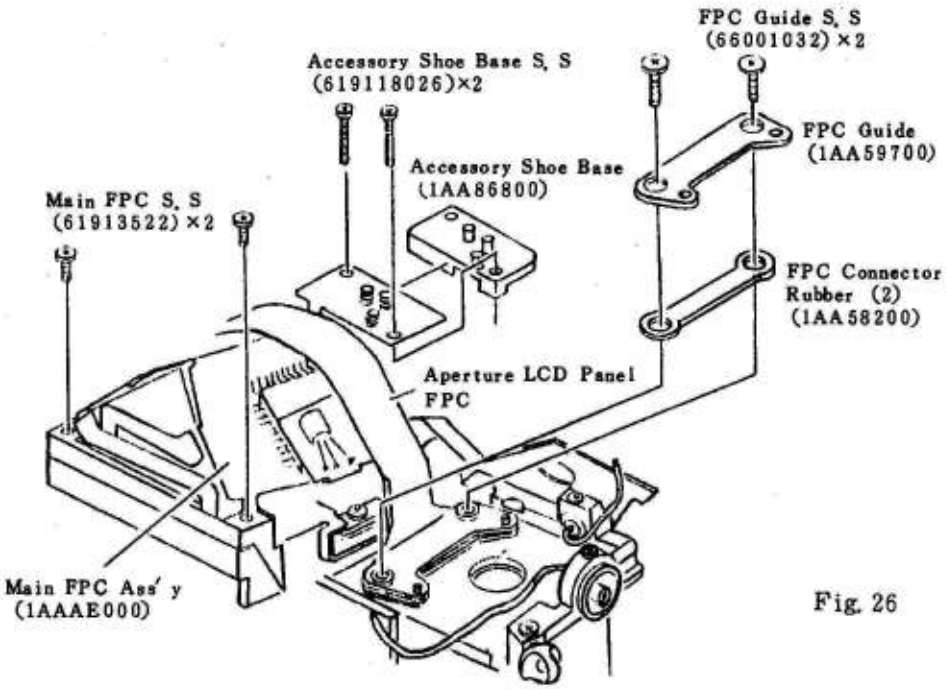

Fig. 26

Note : a) Do not touch the Pattern of the FPC Connector portions with your fingers. Before installing, wipe the Pattern of each FPC Connector portions with ether alcohol or the like.

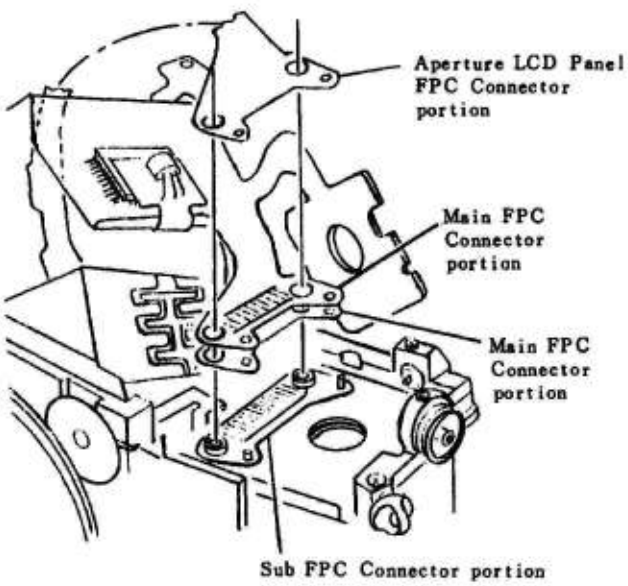

Fig. 27

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B-3. Disassembly of Mirror Box Ass' y

[Caution when handling the Mirror Box Ass' y]

a) Repairing with the Film Rail surface downward after the Eyepiece Ass' y (1AAAA060) is removed will give a damage to the Viewfinder Indicator (A) (1AAAB230). Thus, do not let the Film Rail surface downward. Also, after removing the Mirror Box Ass' y and when putting it down on the desk, make sure to put it with the body mount surface downward in order not to damage the Viewfinder Indicator (A) Ass' y.

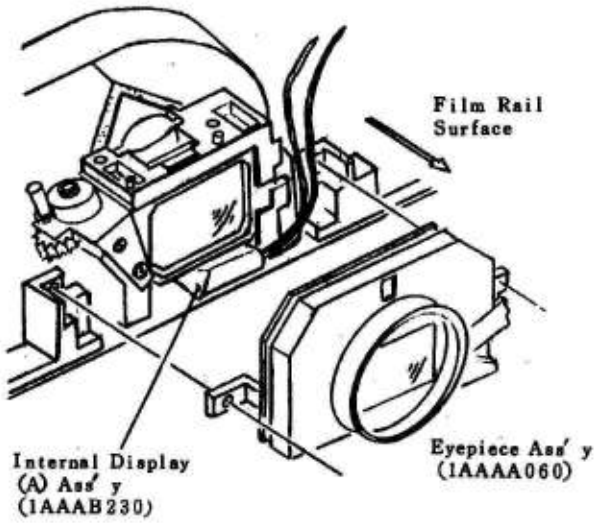

Fig. 28

B-3-1 Removal of the Connector

1. Remove the FPC connector Plate Setscrews (66001041) × 2 and take off the FPC Connector Plate (1) (1AA58100) and the FPC Connector Rubber (1) (1AA58300).
2. Remove the FPC Connector Plate Setscrews (66001041) × 2 and take off the Lug Plate (1AA29800), the FPC Connector Plate (2) (1AA58200) and the FPC Connector Rubber (2) (1AA58400).
3. Raise the Flash Metering FPC in the direction of the arrow to remove it.

Note : a) Do not touch the FPC Connector pattern with your fingers. Before installing, clean the connector pattern with either-alcohol or like solution.

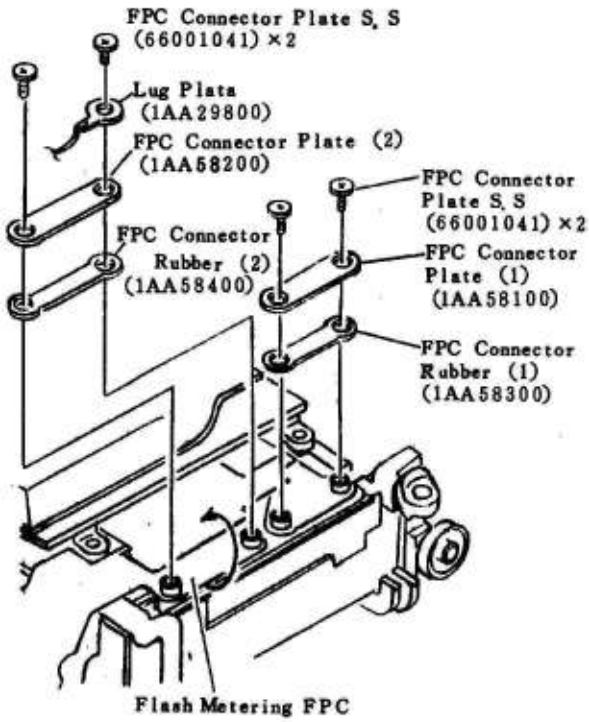
FPC Connector Plate S. S (66001041) ×2
Lug Plate (1AA29800)
FPC Connector Plate (2) (1AA58200)
FPC Connector Plate S. S (66001041) ×2
FPC Connector Rubber (2) (1AA58400)
FPC Connector Plate (1) (1AA58100)
FPC Connector Rubber (1) (1AA58300)
Flash Metering FPC

Fig. 29

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B-3-2 Removal of Rewind Base Plate Ass' y

1. Unsolder the Red and Black Lead Wires (Rewind Motor) on the Rewind Drive FPC.
2. Peel off the Acetate Cloth Tape pasted under the body and unsolder the Orange and Blue Lead Wires (Theta Board)
3. Unsolder the Light-blue and Pink Lead Wires (Cam Board).

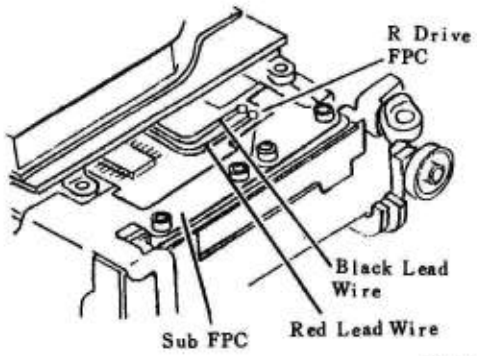

Fig. 30

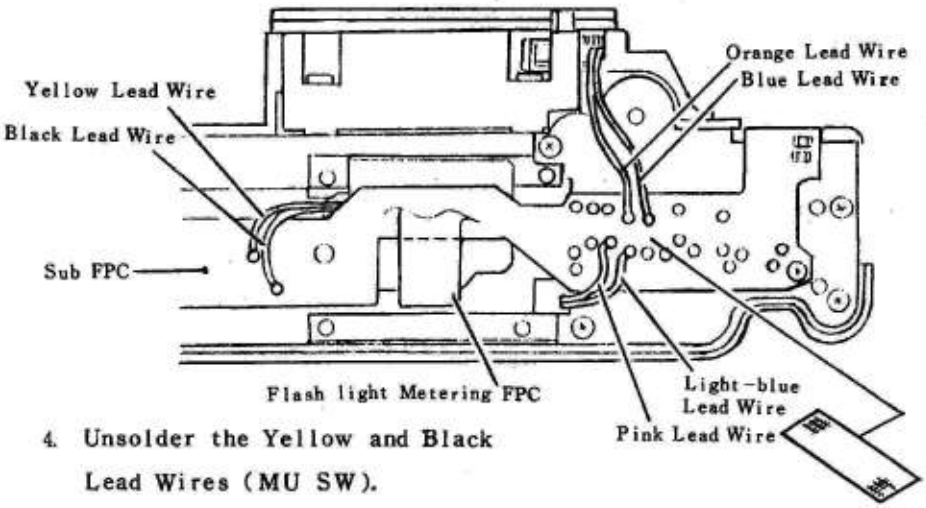

Fig. 31

4. Unsolder the Yellow and Black Lead Wires (MU SW).
5. Remove the Sub FPC Setscrews (61912026) × 2.
6. Remove the Rewind Base Plate Setscrews (61813026) × 4 and take off the Rewind Base Plate Ass' y by rifting it up.

Note a) The Mirror box connot be removed without taking off the Rewind Base Plate Ass' y.

b) Use care to prevent damage to Sub FPC when remove Rewind Base Plate Ass' y.

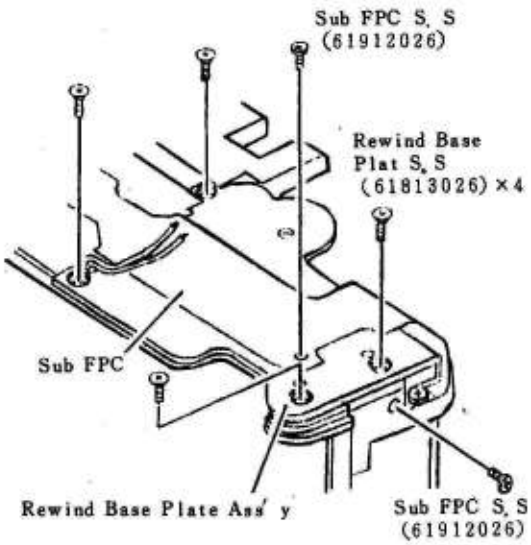

Fig. 32

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B-3-3 Removal of Mech. Bulb Slide Plate Ass' y

1. Remove the Mech. Bulb Plate Setscrew (1AA99000), (619125256)× 2 and take off the Mech. Bulb Slide Plate Ass' y (1AAA170).

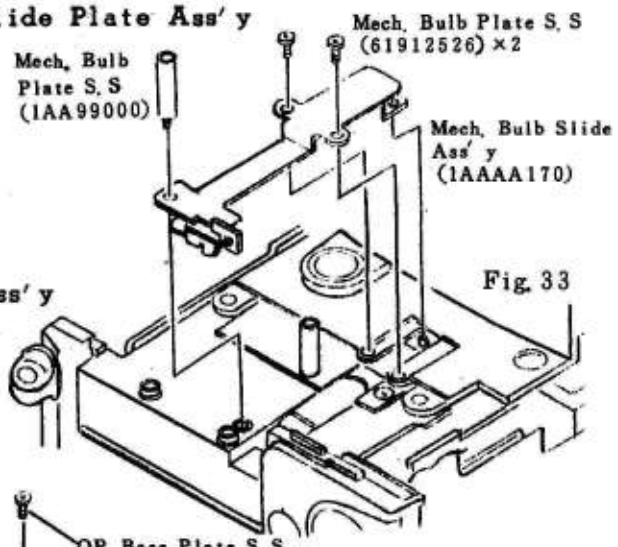

Fig. 33

B-3-4 Removal of Mirror Box Ass' y

1. Remove the QR Base Plate Setscrew (63903026)× 2, (61912026)× 2 and take off the QR Base Plate (1AA48010).

[Caution when handling it]

a) When tightening the QR Base Plate Setscrews, make sure that the set-screws are right ones.

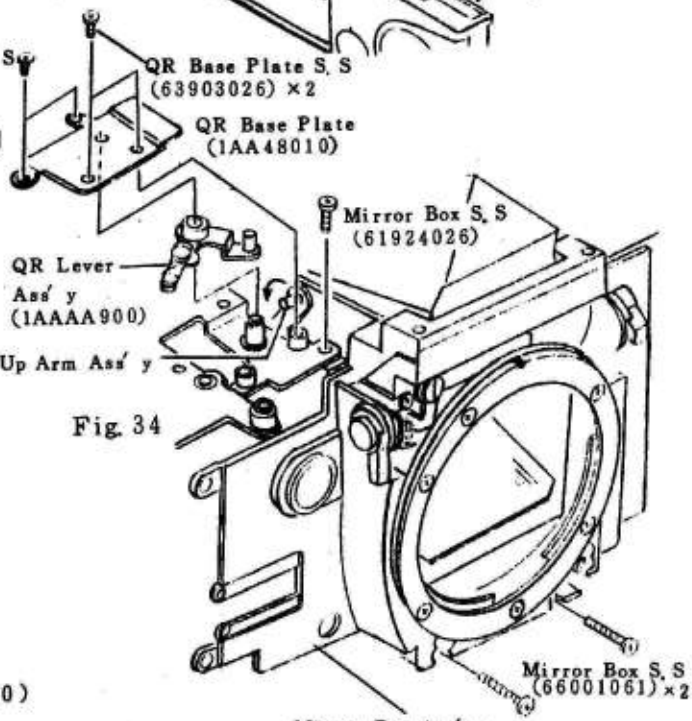
QR Base Plate S. S (61912026) ×2
QR Base Plate S. S (63903026) ×2
QR Base Plate (1AA48010)
Mirror Box S. S (61924026)
QR Lever Ass' y (1AAAA900)
Mirror Up Arm Ass' y

Fig. 34

2. Turn the Mirror Up Arm Ass' y Pin in the direction of the arrow. Holding the Pin, and then remove the QR Lever Ass' y (1AAAA900)

3. Remove the Mirror Box Setscrews (66001061)× 2
4. Remove the Eyepiece Ass' y Setscrew (63914026) and take off the Eyepiece Ass' y. (1AAAA060).
5. Remove the Mirror Box Setscrew (6392626) ×2 and pull straight front to remove Mirror Box Ass' y (1AAAB000).

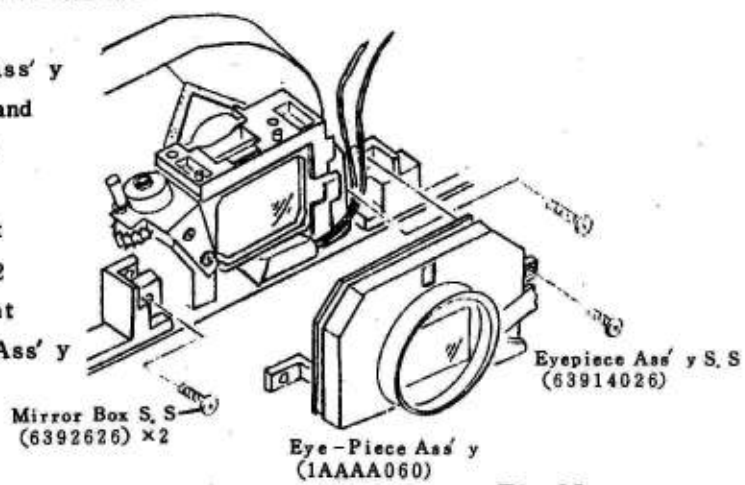

Fig. 35

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B-4 Disassembjy of Sub FPC Ass' y

B-4-1 Removal of thu Sub FPC Ass' y

1. Unsolder the lead wires on the Sub FPC.
   - ① Unsolder the Green, Gray and Black Lead Wires (Release Board).
   - ② Unsolder the Black and Orange Lead Wires (Revolving Limit Switch).
   - ③ Unsolder the Red and B Black Lead Wires (Winding motor).
   - ④ Unsolder the two Coil Wires (Solenoid Plunger).
2. Unsolder the soldered joints of the Perforation FPC (4 location).
3. Remove the Rewind Switch Setscrew (61922526).
4. Remove the Sub FPC Setscrews (61911526) and take off the Sub FPC Ass' y (1AAAE400).

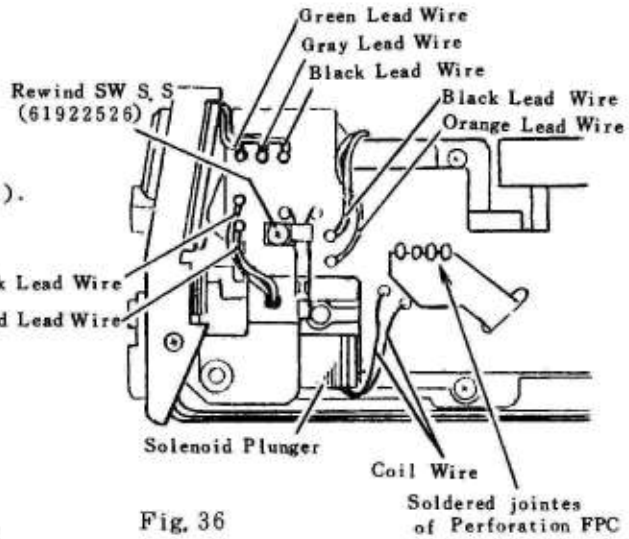

Fig. 36

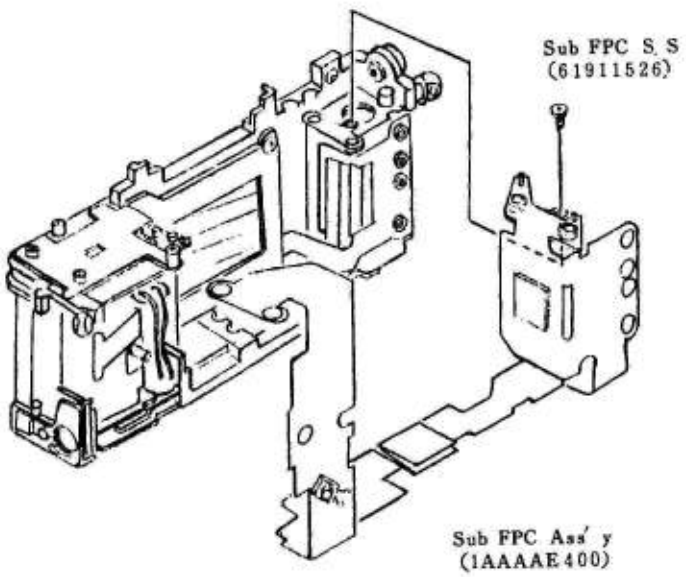

Fig. 37

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B-5 Disassembly of Vertical Release Base Ass' y

B-5-1 Removal Vertical Release Base Ass' y

1. Remove the Vertical Release Base Setscrews (63924026 and 6183026) and take off the Vertical Release Base Ass' y (1AAAA180).

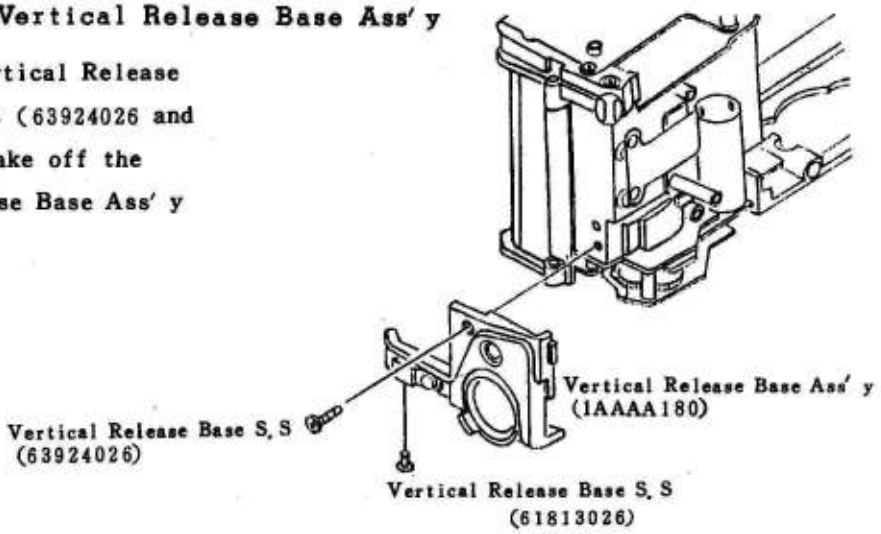

Fig. 38

B-6 Disassembly of Winding Unit

B-6-1 Removal of Winding Unit

1. Remove the Sprocket Setscrews (66001136)× 2
2. Remove the Winding Unit Setscrews (1AA36610, 61823026, 61922526) and take off the Winding Unit Ass' y.
3. Removal of Winding Unit Ass' y results in disconnecting the Sprocket (1AA32820) and the Spool (1AA36200).

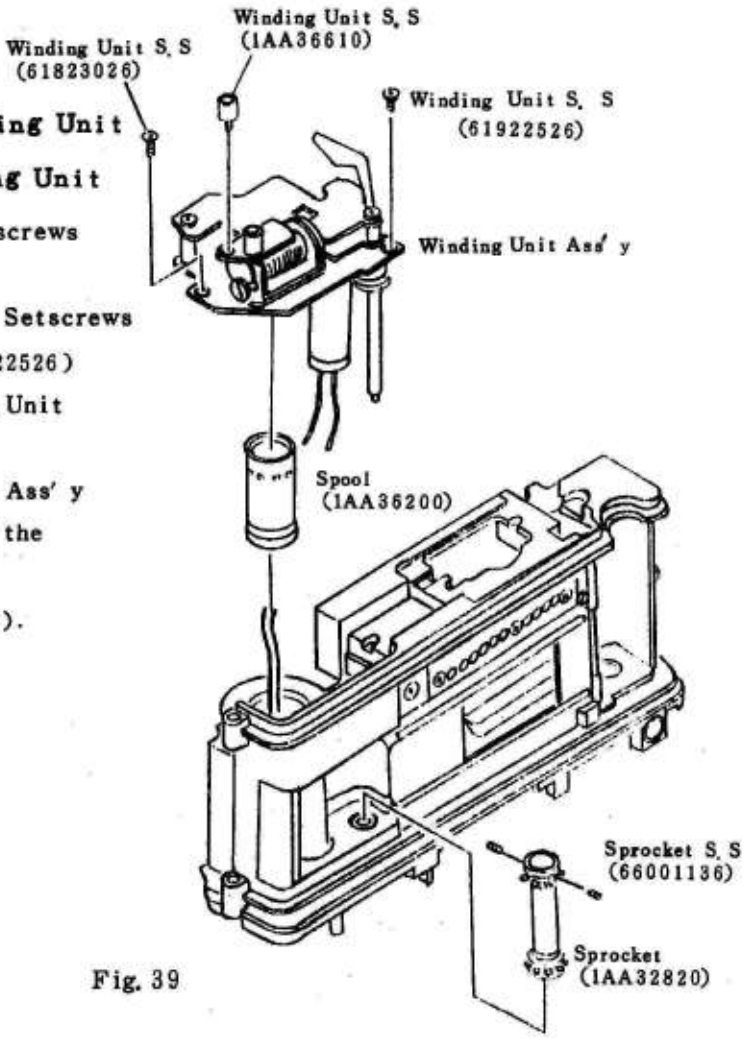

Fig. 39

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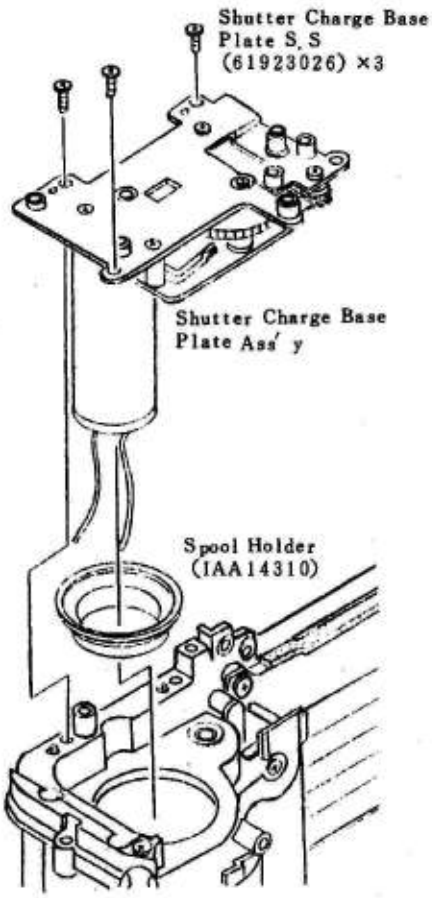
B-7 Disassembly of Shutter Charge Base Plate Ass' y

B-7-1 Removal of shutter Charge Base Plate

1. Remove the Shutter Charge Base Plate Setscrews (61923025)× 3 and take off the Shutter Charge Base Plate Ass' y, This also results in removal of the Spool Holder (1AA14310).



(Spool holder grease application diagram)

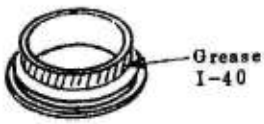
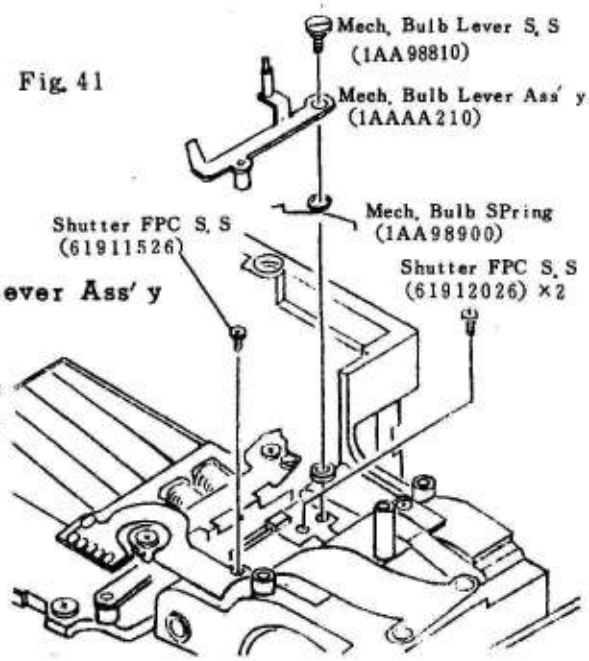


Fig. 40

B-8 Disassembly of Shutter

* The Shuter cannot be removed without taking off the Vertical Release Base Ass' y and the Winding Unit Ass' y.
The shutter can be removed without taking off the Shutter Charge Base Plate Ass' y.

Fig. 41


Mech. Bulb Lever S. S (1AA98810)
Mech. Bulb Lever Ass' y (1AAAA210)
Mech. Bulb SPring (1AA98900)
Shutter FPC S. S (61911526)
Shutter FPC S. S (61912026) ×2

B-8-1 Removal of Mech. Bulb Lever Ass' y

1. Remove the Mech. Bulb Lever Setscrew (1AA98810) and take off the Mech.Bulb Lever Ass' y (1AAAA210) and the Mech. Bulb spring (1AA98900)
2. Remove the shutter FPC Setscrews (61911526) (61912026)

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B-8-2 Removal of Shutter

1. Remove the Shutter Setscrews (61925029, 66001065, 66001043) and take off the Shutter (1AA51600).

〔Caution when removing Shutter〕

a) Do not touch the shutter blades.

b) Since the Light-Proof Moquette is pasted on the body, the shutter will not easily come off. Remove it with care.

c) When the Light-Proof Moquette is cut, replace it with new one.

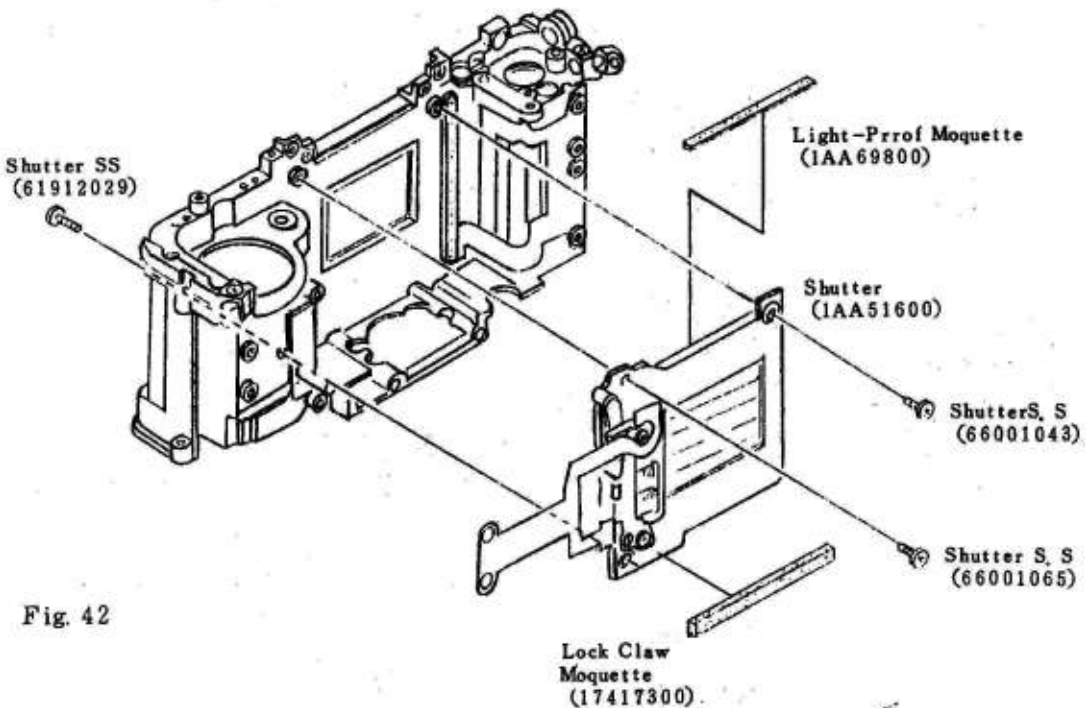

Fig. 42

B-9 Disassembly of DX-FPC Ass'y

B-9-1 Removal of DX-FPC Ass'y

1. Remove the Contact Pin Cover Setscrews (61912028)× 3 and take off the Contact Pin Cover (1AA10600).

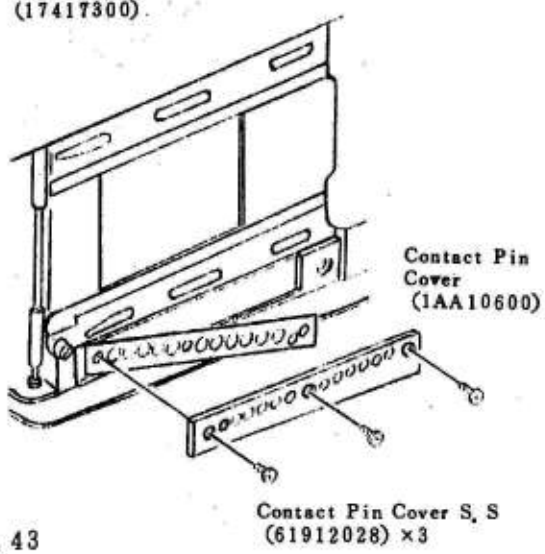

Fig. 43

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2. Remove the DX-FPC Ass' y Setscrews (61813026)× 2 and take off the DX-FPC Ass' y (1AAAA260).
3. Remove the Sub FPC Insulation Sheet (1AA57700).

B-10 Disassembly of Film Hold Ass' y

B-10-1 Removal of Film Hold Ass' y

1. Remove the Film Hold Ass' y Setscrews (61912526)× 2 and take off the Film Hold Ass' y (1AAAA220).

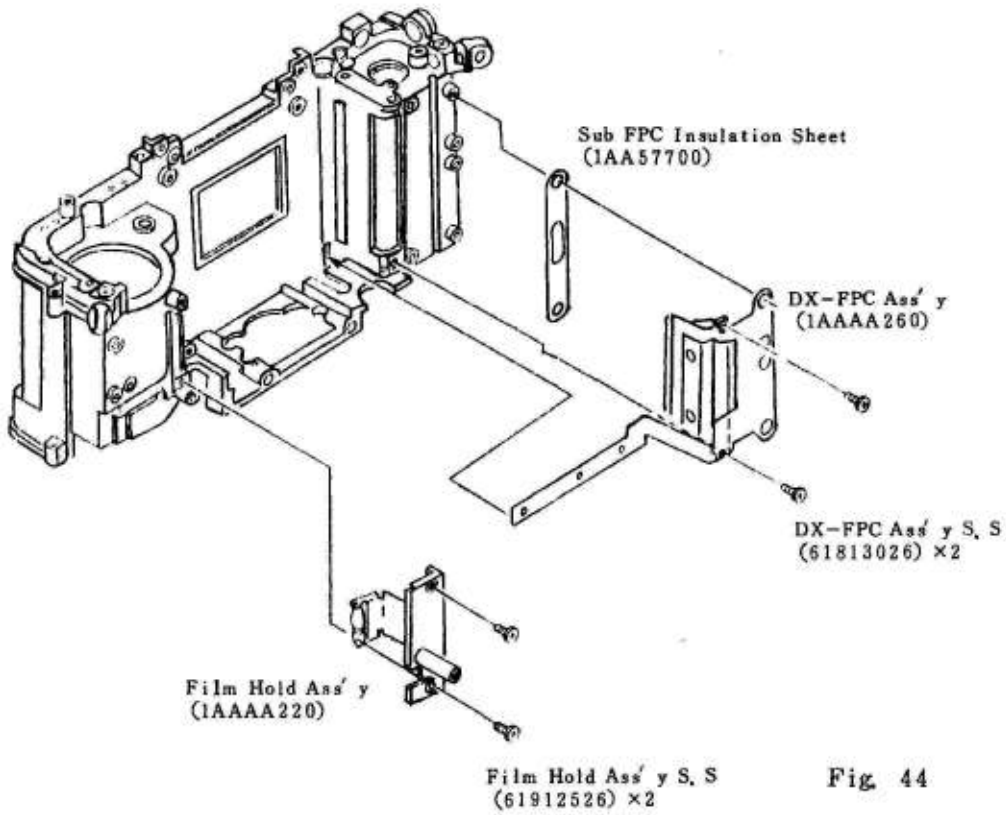

Fig. 44

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B-11 Disassembly of Mirror Box Ass' y

B-11-1 Removal of Focusing Screen

Note : a) Never touch with your fingers the Focusing Screen which is a highly precision part. When removing the Focusing Screen, pay attention not to leave fingerprints on the mirror or give a damage to it.

1. When the Screen Lock Claw in the Mirror Box is pulled out toward you, the Focusing Screen Holder comes down.
2. Take out with tweezers the Focusing Screen in the Focusing Screen Holder.

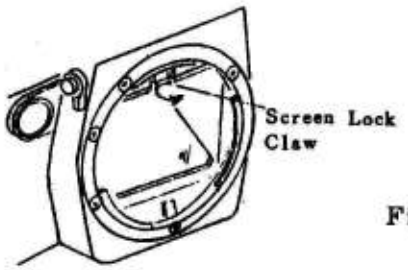

Fig. 45

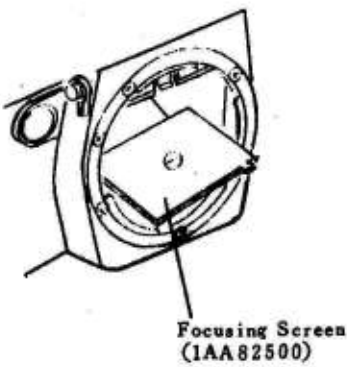

Fig. 46

B-11-2 Disassembly of Penta Prism

Note : a) The field of view being approximately 100%, the parallax will differ after finder focusing adjustment and removal of the Penta Prism Ass' y (1AAAB040). Then adjust the Parallax.

b) The Shielder (black) is applied between the Penta Prism and the Penta Prism Holder to prevent foreign materials from entering into the Viewfinder. Remove the Shielder to take off the Penta Prism. After installing the Penta Prism, apply the Shielder in a gap between the Penta Prism Holder and the Penta Prism.

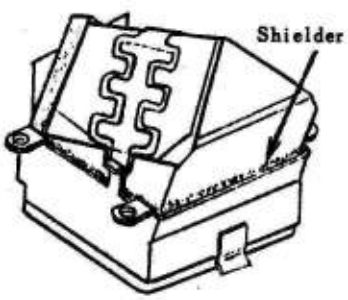

Fig. 47

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1. Remove the Dioptric Adjustment Ass' y Setscrews (61813026)× 2 and take off the Dioptric Adjustment Ass' y (1AAAB020).
2. Remove the S-LCD Panel FPC Setscrew (61912026).
3. Remove the Viewfinder Indicator (A) Ass' y Setscrews (69112066)× 2 and take off the Viewfinder Indicator (A) Ass' y (1AAAB230).

Note : a) After removing the Viewfinder Indicator (A) Ass' y, adjust the position of the Aperture LCD.

b) Do not damage the Viewfinder Indicator prism (A).

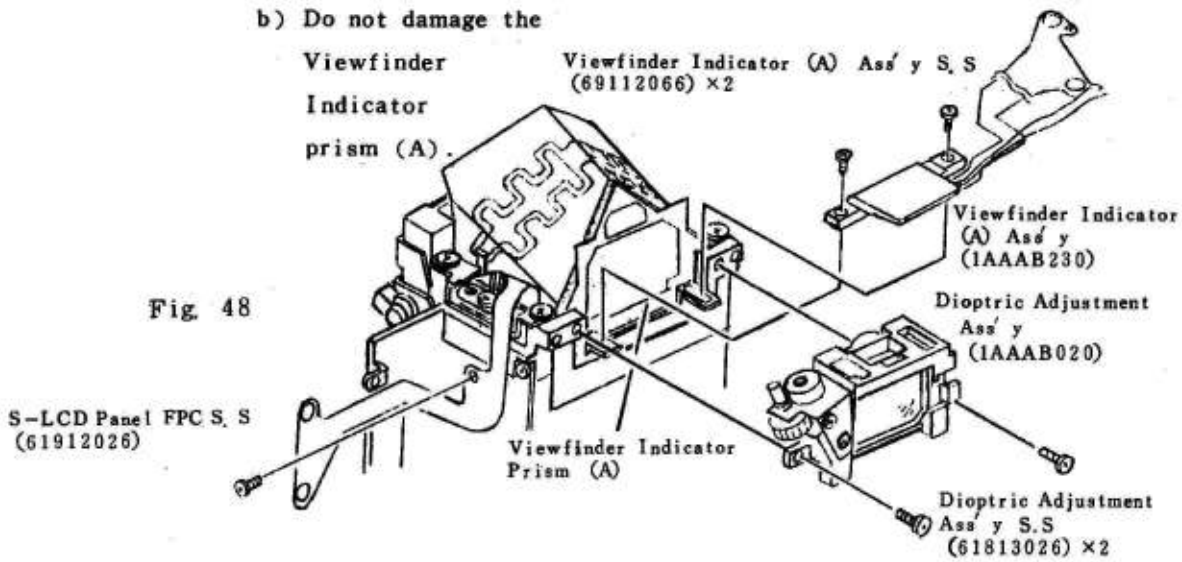
Viewfinder Indicator (A) Ass' y S. S (69112066) ×2
Viewfinder Indicator (A) Ass' y (1AAAB230)
Dioptric Adjustment Ass' y (1AAAB020)
S-LCD Panel FPC S. S (61912026)
Viewfinder Indicator Prism (A)
Dioptric Adjustment Ass' y S.S (61813026) ×2

Fig. 48

4. Remove the Penta Prism Holder Setscrews (66001025)× 4 and take off the Viewfinder Indicator (B) Ass' y and the Penta Prism Ass' y (1AAAB040).

Note : a) When removing the Penta Prism Ass' y, do it with care for there is a washer for focusing adjustment that is located under the Penta Prism Holder. When installing the Penta Prism Ass' y, place the washer in the same position.

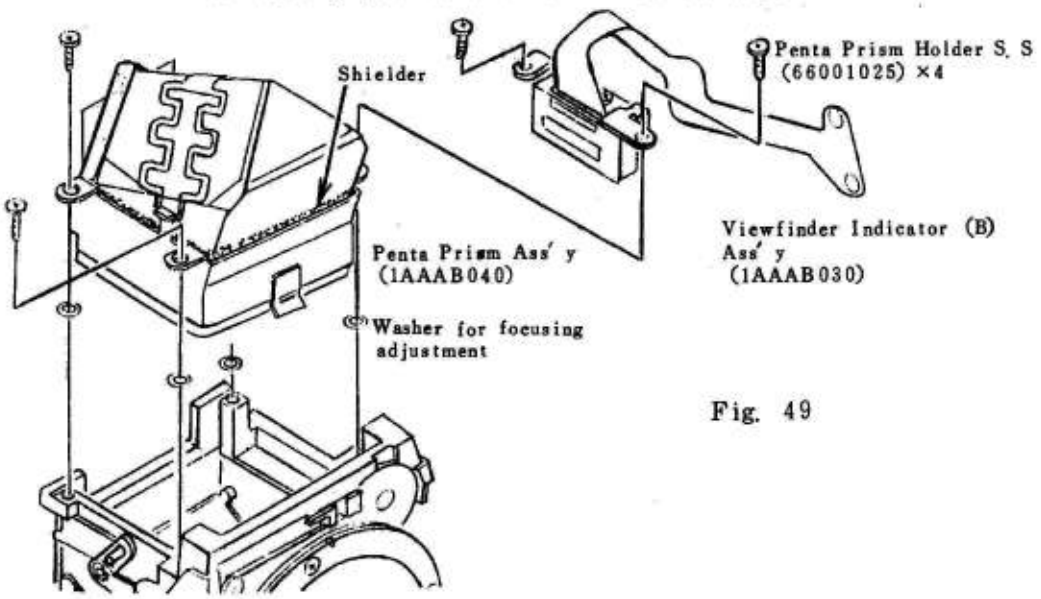
Shielder
Penta Prism Holder S. S (66001025) ×4
Viewfinder Indicator (B) Ass' y (1AAAB030)
Penta Prism Ass' y (1AAAB040)
Washer for focusing adjustment

Fig. 49

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5. Take out with tweezers the shield that is applied around the Penta Prism.
6. Peel off the Penta Prism Dust-Proof Moquette (1AA82110) and remove the Penta Cover (17484210).
   * The Penta Cover is pasted on the Penta Prism Fixer with double stick tape.
7. Remove the Penta Prism Fixer (1AA81000) and take off the Penta Prism Cover (1AA80900), the Penta Prism (1AA80800) and the Viewfinder Frame (B) (1AA80700).

Note :

a) The Viewfinder Indicator Prism (A), the Viewfinder Indicator Prism (B) and the Penta Prism Spacer are UV (Ultra Violet)-bonded, thus cannot be disaseembled. The Condenser Lens cannot be removed without first taking off the Penta Prism Spacer.

b) The Shieder is applied under the Penta Prism to be secured with the Viewfinder Frame (B) for the purpose of preventing foreign materials from entering it.
Then, much care must be taking when disassembling them.

c) Do not wipe the Viewfinder Indicator (A) and Viewfinder Indicator (B) with any alcohol or the like.

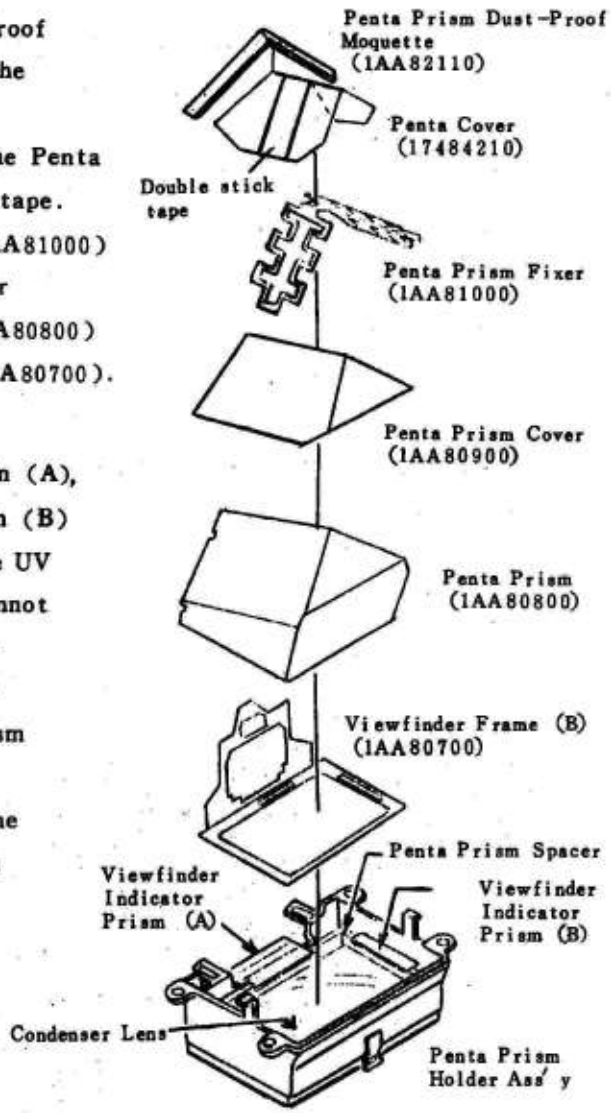

Fig. 50

* UV (Ultra Violet) bonding

Apply adhesives PC-OIH and 358LOCTITE to a part to be bonded and irradiate ultra violet rays to it so that the adhesives harden to add further strength. This is called a UV bonding. But we don't supply the UV irradiating equipment. Thus, use epoxy resin related adhesives which are quick in hardening. When using an epoxy resin adhesive, install the parts with the adhesive only after it has hardened enough. (Leave it for 24 hours.)

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B-11-3 Removal of Spot Metering Ass' y

Note :

a) Do not disassemble the Spot Metering Ass' y unless it is defective. When the Spot Metering Ass' y is removed, adjust the spot metering positioning.

b) Do not disassemble and repair the Spot Metering Ass' y. The Spot Metering Ass' y is UV bonded. Even if disassembled, it cannot be checked without special tools, Therefore, replace it with new one.

1. Remove the M. Moquette (1AA678)× 2 and unscrew the Spot Metering Setscrews (63911526)× 2.
2. Remove the Spot Metering Adjustment Screws (1AA67300)× 2 and take off the Spot Metering Ass' y (1AAAB050).

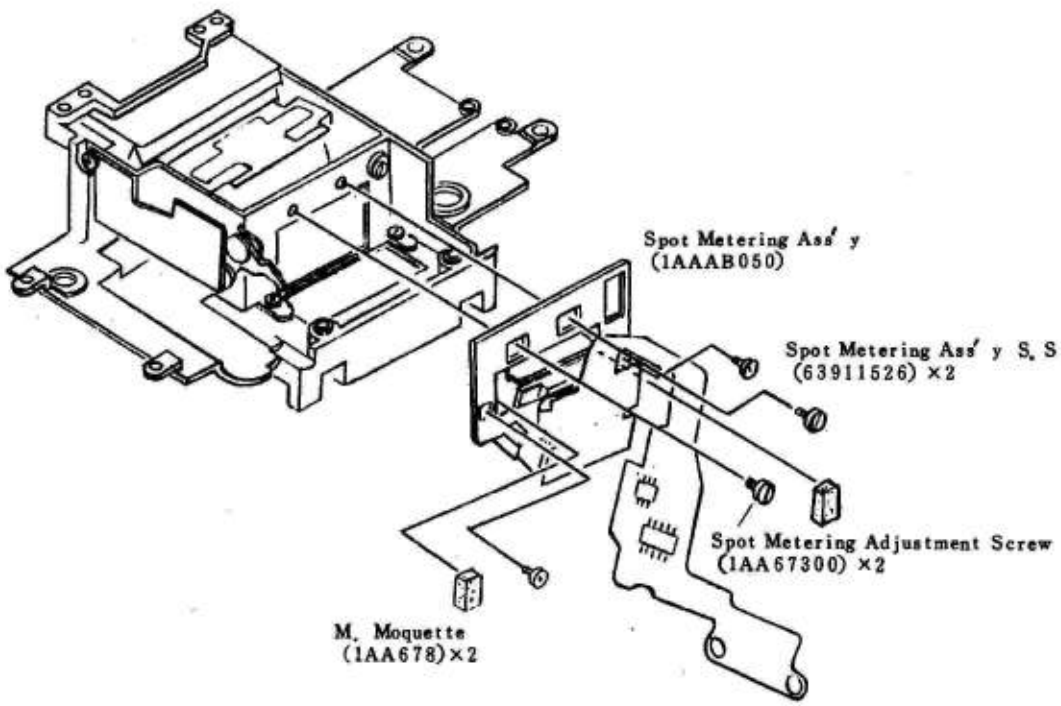

Fig. 51

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B-11-4 Remval of Mirror Box Base Plate Ass' y

1. Remove the Aperture Control Ass' y Setscrews (61912526)× 3 and take off the Aperture Control Ass' y (1AAAB010).

Note : a) The Aperture Control Ass' y cannot be checked without s special tools. Replace the Aperture Control Ass' y with new one.

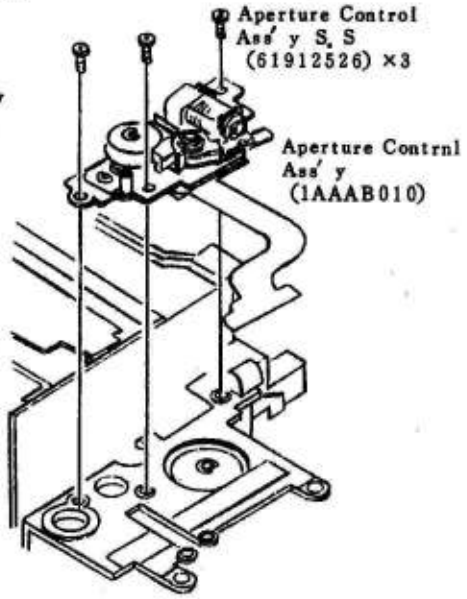

Fig. 52

2. Remove the FPC Protective Plate Setscrews (61912026 and 61923026) and take off the FPC Protective Plate (1AA65900) and the washer (60122112).
3. Remove the Mirror Box Base Plate Ass' y Setscrews (61922026)× 2, (61923026)× 3 and take off the Mirror Box Base Plate Ass' y from Mount Base Ass' y (1AAAB070).

Note : a) Pay attention to the Light-Proof Curtain (1AA76400) when removing the Mirror Box Base Plate Ass' y.

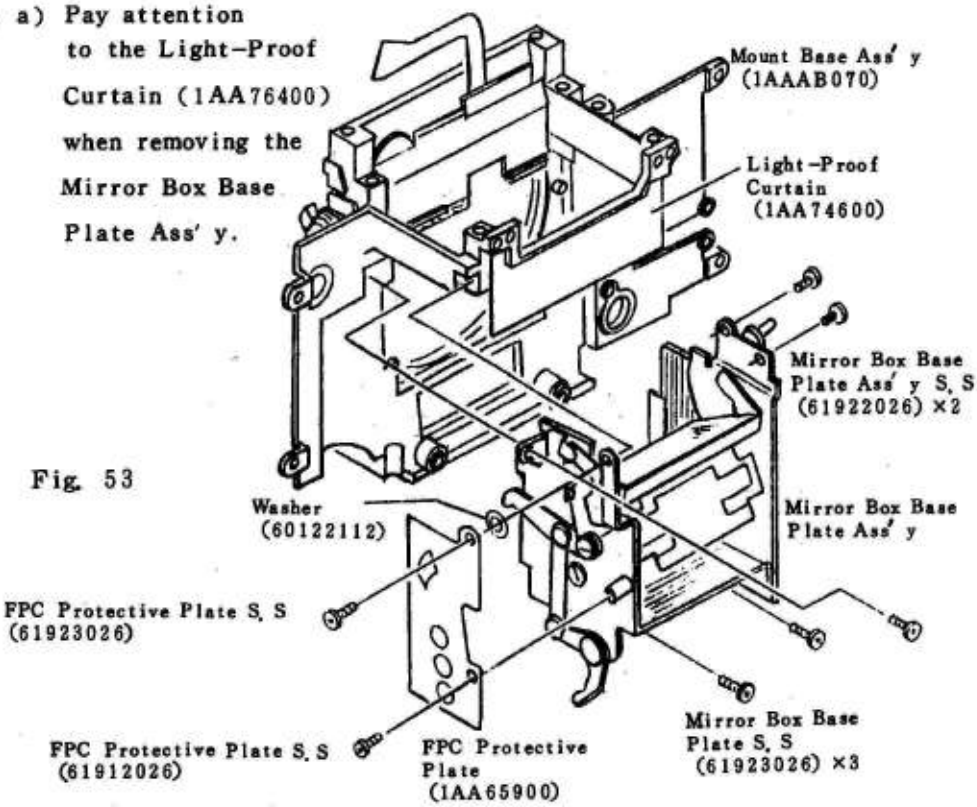
Mount Base Ass' y (1AAAB070)
Light-Proof Curtain (1AA74600)
Mirror Box Base Plate Ass' y S. S (61922026) ×2
Mirror Box Base Plate Ass' y
Washer (60122112)
FPC Protective Plate S. S (61923026)
FPC Protective Plate S. S (61912026)
FPC Protective Plate (1AA65900)
Mirror Box Base Plate S. S (61923026) ×3

Fig. 53

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B-12 Disassembly of Back Cover

B-12-2 Removal of Back Cover

1. Remove the Battery Cover Ass' y (1AAAA340) by turning the Battery Cover Screw with (-) screwdriver and take out the Lithium Battery (CR2025).

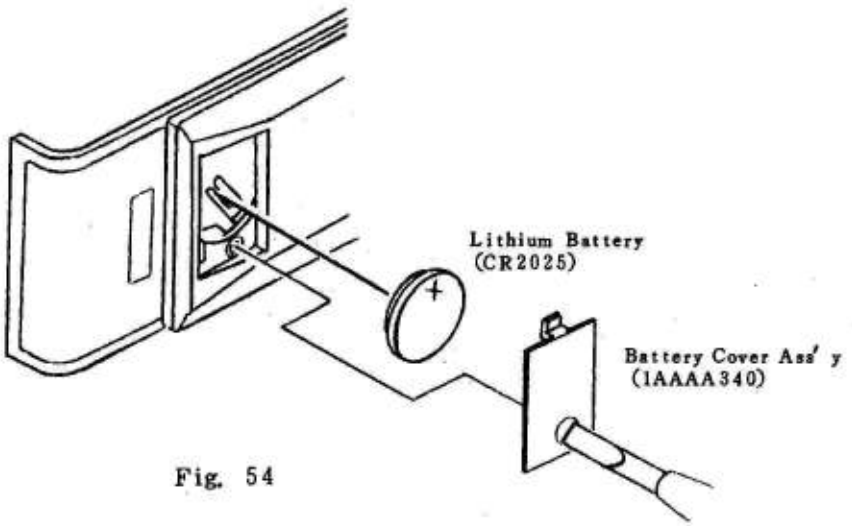

Fig. 54

Note : a) Do not scratch the Battery Cover Screw.

2. Remove the Back Cover Setscrews (69113586)× 3, (69116076)× 3 and take off the Back Covering (1AA16010).

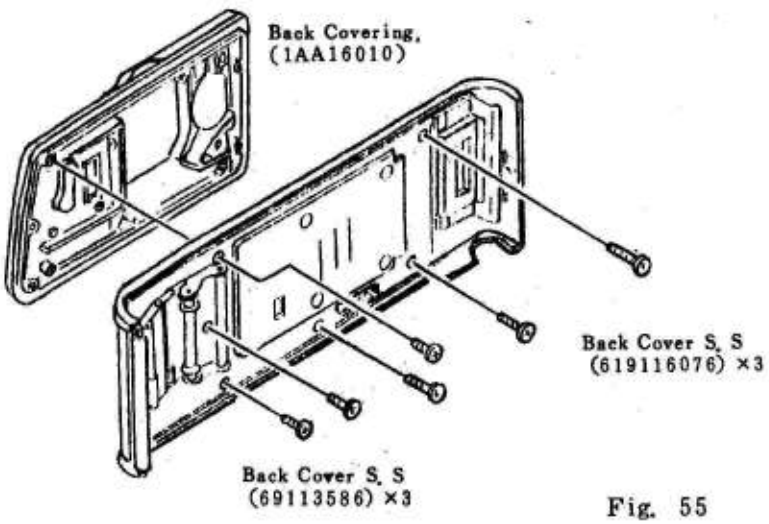

Fig. 55

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3. Unsolder the two coil wires on the Vacuum Base Plate Ass' y.

Note : a) You may find that some are soldered in the back side of the Vacuum Base Plate. If so, first remove the Plate and unsolder the wires.

4. Remove the E Ringe (66101225)× 4 and take off the Vacuum Unit Ass' y (1AAAA360).
Removal of the Vacuum Unit Ass' y results also in disconnection of the Pressure Plate Springs (1AA15400).

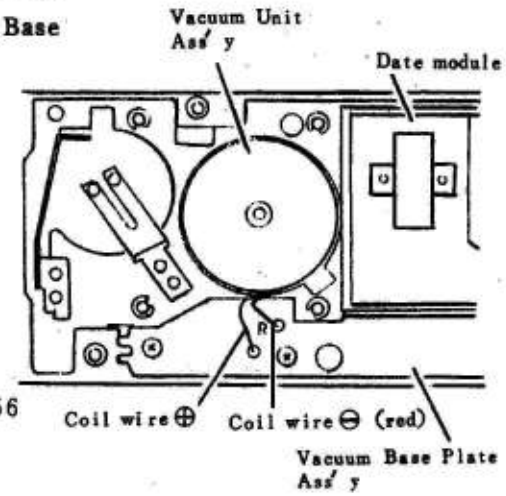

Fig. 56

Notes

a) The Pressure Plate Spring exhibits different elasticity depending on its direction. Take care to place it in position when assembling.

b) The Vacuum Unit Ass' y is sealed with crazy glue or super glue. When reassembling it after removal, the air may go in between. It so, an inspection will be necessary to check vacuum operation and air leakage by means of special tools. Replace the whole Vacuum Unit Ass' y with new one.

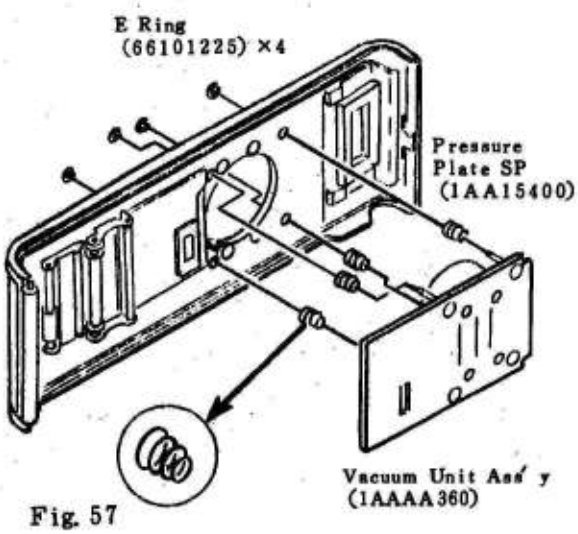

Fig. 57

5. Unsolder the Pink, Black and Blue Lead wires on the Date Module.

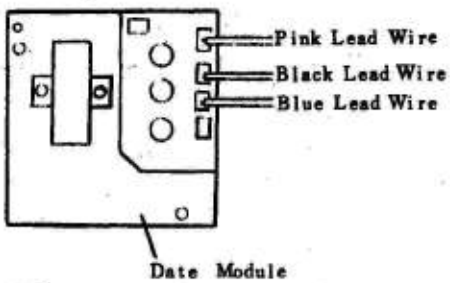

Fig. 58

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6. Remove the Vacuum P.C Board Setscrews (69113576)×2 and take off the Vacuum P.C Board Ass' y (1AAAAE600). This accopanies disconnection of the Back Cover Contact Springs (1AA15000)×5 and the Back Cover Contact Pins (1AA14900)×5.
7. Unsolder the Pink and Black Lead Wires on the Vacuum P.C Board.
8. Remove the Date Module (1AA55000).

Notes:

a) After Date position adjustment, the Date Module is fixed on the Back cover with crazy glue or super glue. Adjust it with position adjusting tools. When the Date Module is replaced anew, perform Date position adjustment. And fix the surroundings of the Date Module with crazy glue or super glue. After more than 15 minutes of open timing, assemble it.

b) After the Date Module is replaced anew, make the land (indicated with Ⓐ in the figure) short-circuited.

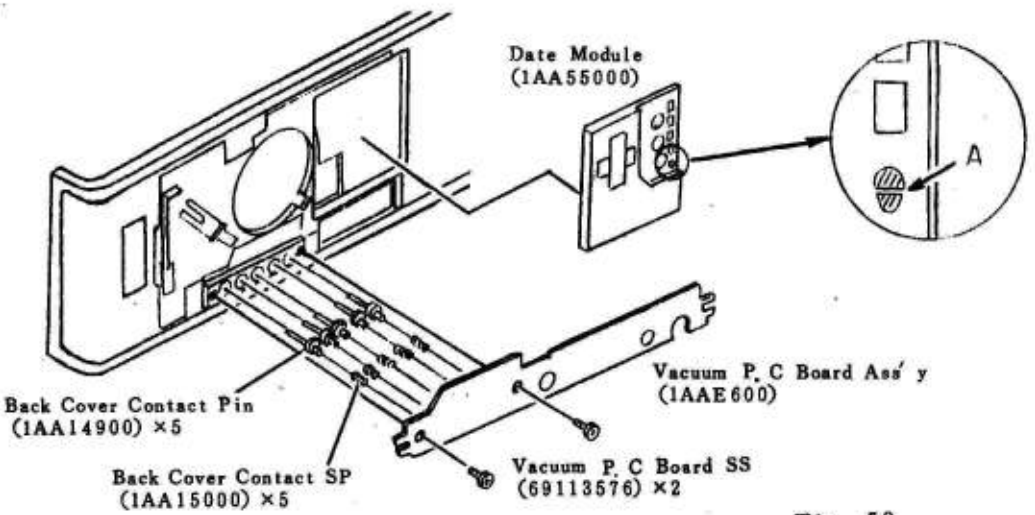

Fig. 59

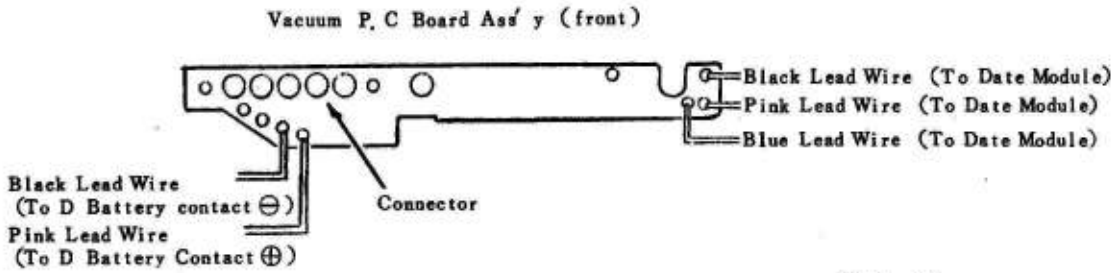
Vacuum P. C Board Ass' y (front)
Black Lead Wire (To Date Module)
Pink Lead Wire (To Date Module)
Blue Lead Wire (To Date Module)
Black Lead Wire
(To D Battery contact ⊖)
Pink Lead Wire
(To D Battery Contact ⊕)
Connector

Fig. 60

c) Wipe the five terminals on the connector with enter-alcohol or the like.

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C Reassembly and Adjustment Procedures

C-1 Reassembly and Adjustment of Ass' y Parts

C-1-1 Assembly of Shutter Charge Base Plate

1. Install the Multi-Exp. Release Lever Spring (1AA48310) on the Multi-Exp. Release Lever located in the back side of the Shutter Charge Upper Base Plate Ass' y (1AAA610). And fix it with an adhesive (Cemedine 551A).
2. Install the Shutter Charge Motor (1AA51510) on the Shutter Charge Lower Base Plate Ass' y (1AAAA640) and tighten the Shutter Charge Motor Setscrews (61912226)×2.
3. Install the Control Lever Spring (1AA47010) (Pay attention to the direction)
4. Install the Aperture Set Arm Spring (1AA47100), secure it with the E Ring (66101512) and fix the Aperture Set Arm Sprig with an adhesive (Cemedine 551A).
5. Install the timing Switch (17441320) and tighten the Timing Switch Setscrew (63904022).

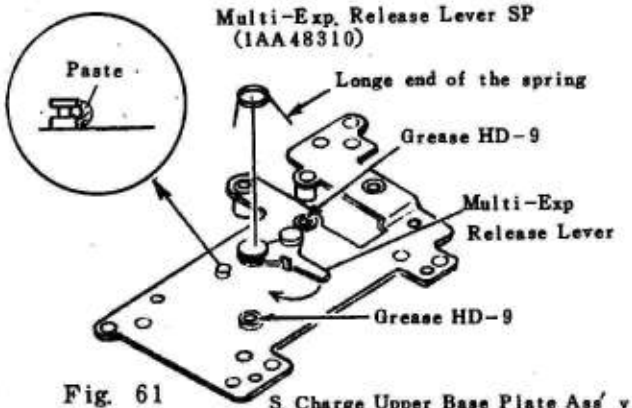

Fig. 61

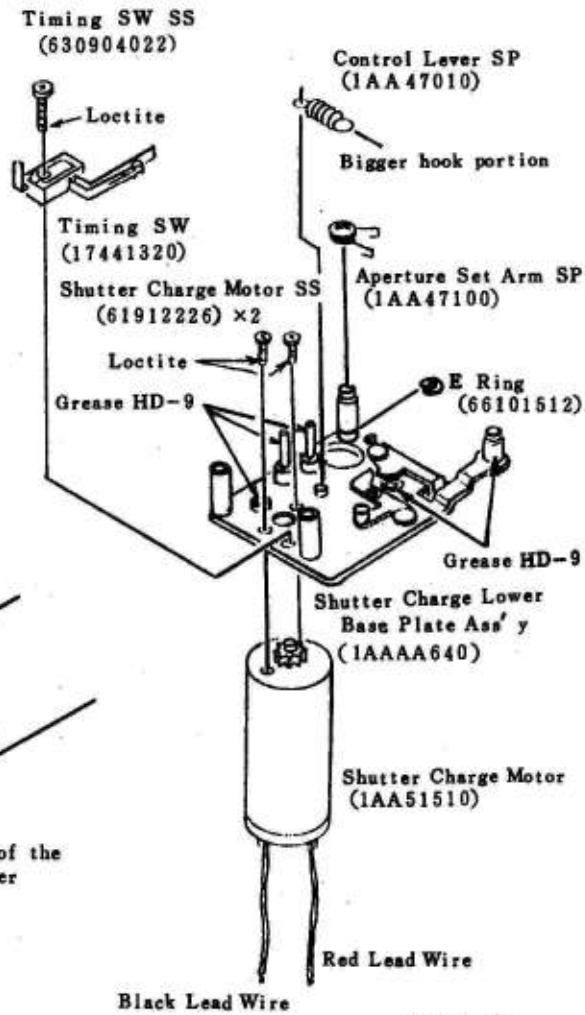

Fig. 62

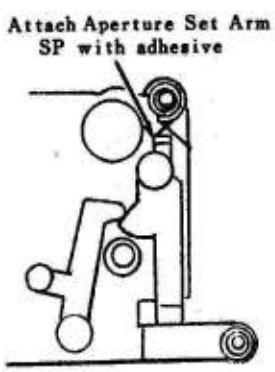

Fig. 63

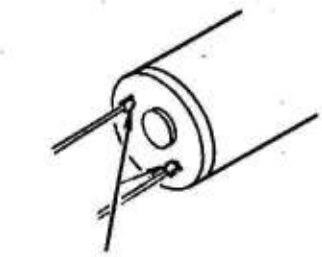

Fig. 64

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6. Install the Shutter Charge Cam Ass' y so that the Control Lever Pin is set in the groove below the Shutter Charge Cam Ass' y.

7. Install in the order of the Shutter Charge Lever Ass' y (1AAAA630), the Friction Gear Ass' y (1AAAA620), the Shutter Charge Gear (4)(1AA46200) and Shutter Charge Gear (3)(1AA46110).

8. While sliding the Multi-Exp. Release Lever located under the Shutter Charge Upper Base Plate Ass' y (1AAAA610) in the direction of the arrow,(See Fig 66) install the Shutter Charge Upper Base Plate Ass' y.

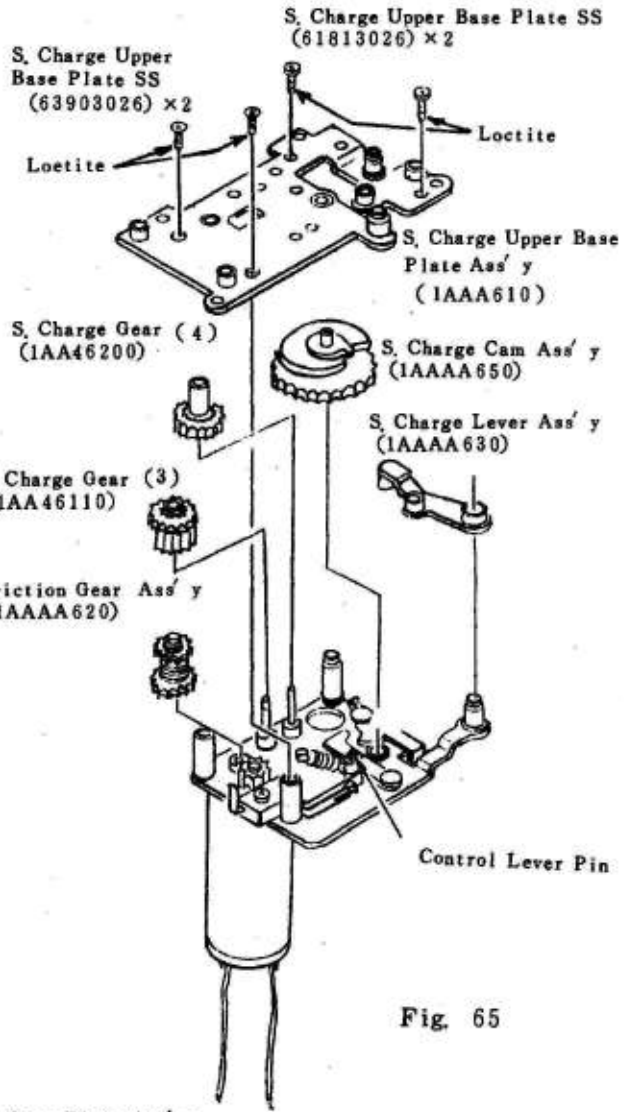

S. Charge Upper Base Plate SS (61813026) ×2
S. Charge Upper Base Plate SS (63903026) ×2
Loctite
Loetite
S. Charge Upper Base Plate Ass' y (1AAA610)
S. Charge Gear (4) (1AA46200)
S. Charge Cam Ass' y (1AAAA650)
S. Charge Lever Ass' y (1AAAA630)
S. Charge Gear (3) (1AA46110)
Friction Gear Ass' y (1AAAA620)
Control Lever Pin

Fig. 65

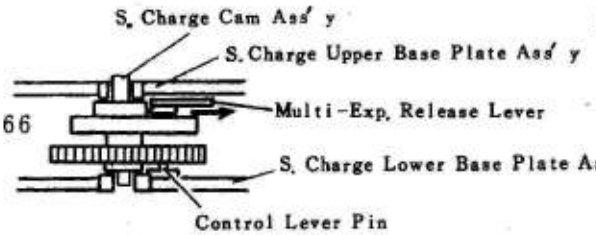


Fig. 66

9. Tighten the Shutter Charge Upper Base Plate Setscrews (61813026)×2,(63903026)×2.

(Diagram for applying grease on S. Charge Cam Ass' y)

Top view

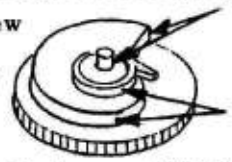
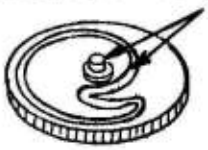


Fig. 67

○Apply grease HD-9 around the cam.



Bottom view

Fig. 68

○Apply grease HD-9 on the whole of the groove.

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〔Confirmation of operation of Shutter Charge Cam Ass' y〕

Turn the Shutter Charge Cam clockwise ① (mirror up direction) until it stops and turn it counterclockwise ②(shutter charge)Check if it turns smoothly.
Make sure that there is no stumble or unevenness.

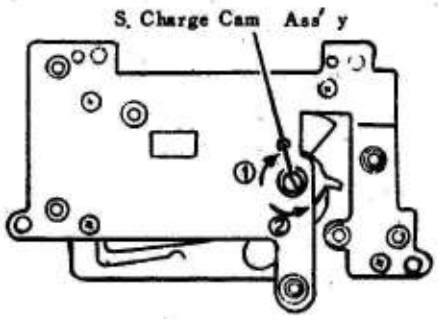

Fig. 69

The start position (initial position) of a shutter charge is where the S. charge stops after turning it clockwise.

〔Adjustment of the Timing Switch interval〕

a) With the Shutter Charge Cam Ass' y in the initial position, the Timing Switch interval shall be more than 0.6㎜.

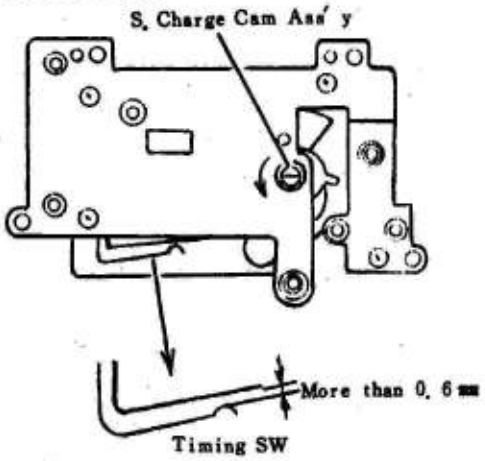

Fig. 70

b) When the Shutter Charge Cam is rotated for approximately 240° with the Shutter Charge Cam Ass' y turned counterclockwise, the Timing Switch shall be contacted without fail. And when the Shutter Charge Cam is further turned counter-clockwise and it comes back to the initial position, the Timing Switch shall be in the OFF position.

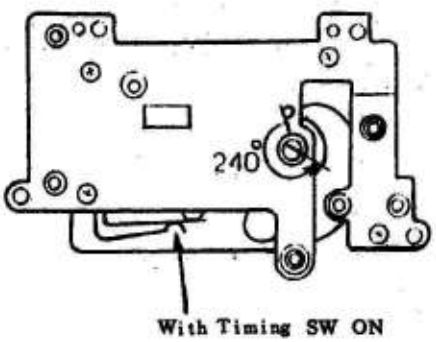

Fig. 71

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C-1-2 Assembly of Winding Unit Ass' y

1. Fit the Revolving Limit Switch (1AA57310) to the Winding Upper Base Plate Ass' y (1AAAA600) and secure it with the Revolving Limit Switch Setscrew (61922526). Attach the Revolving Limit Switch with an adhesive (cemedine 551A). (See Fig. 73).

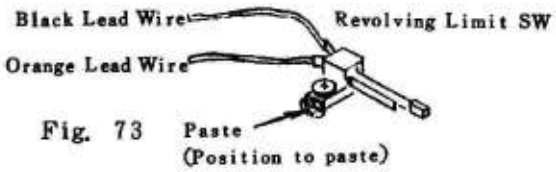

Fig. 73

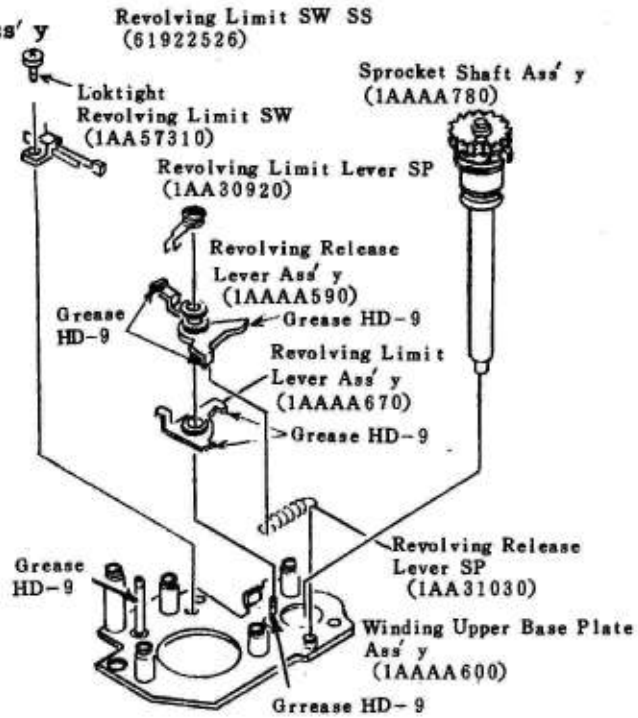

Fig. 72

2. Install the Revolving Limit Lever Ass' y (1AAAA670) and the Revolving Release Lever Ass' y (1AAAA590).
3. Install the Revolving Release Lever Spring (1AA31030) and attach the both ends with an adhesive (cemedine 551). (See Fig.74)
4. Install the Revolving Limit Lever Spring (1AA30920). (See Fig. 74)
5. Install the Sprocket Shaft Ass' y (1AAAA780).

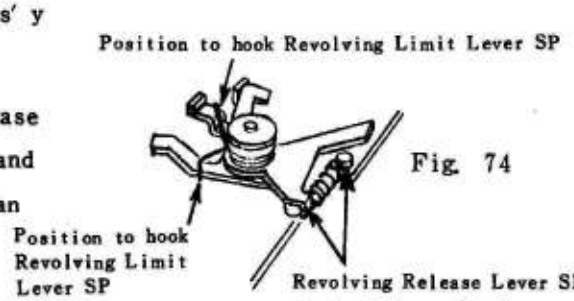

Fig. 74

6. Place the Solenoid Plunger (1AA51800) on the Winding Mid Base Plate Ass' y (1AAAA580) and secure it with the Solenoid Plunger Setscrews (61902226)×2.
7. Install the Sprocket Bearing (1AA31600).
8. Install the Winding Gear (10) (1AA36020).

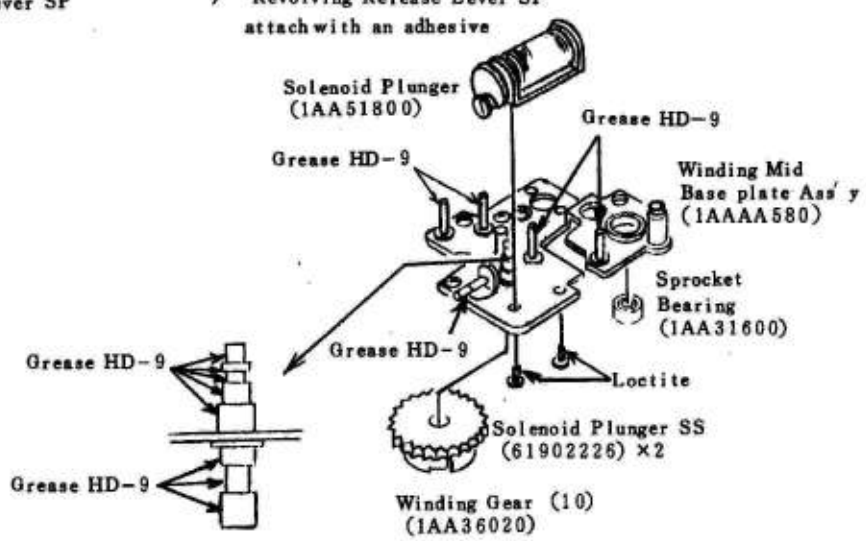

Fig. 75

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9. Fit the Winding Mid Base Plate Ass' y to the Winding Upper Base Plate Ass' y and secure it with the Winding Mid Base Plate Setscrews (660001068)×3, (66001039).
10. Install the Release Lever Hook Ass' y (1AAAA680).
11. Install the Release Lever Hook Spring (1AA33720).
12. Install the Rewind Lever Hook Ass' y (1AAAA690), and hook up the Release Lever Hook Spring with both the release Lever Hook Ass' y and the Rewind Lever Hook Ass' y. (See Fig 77)

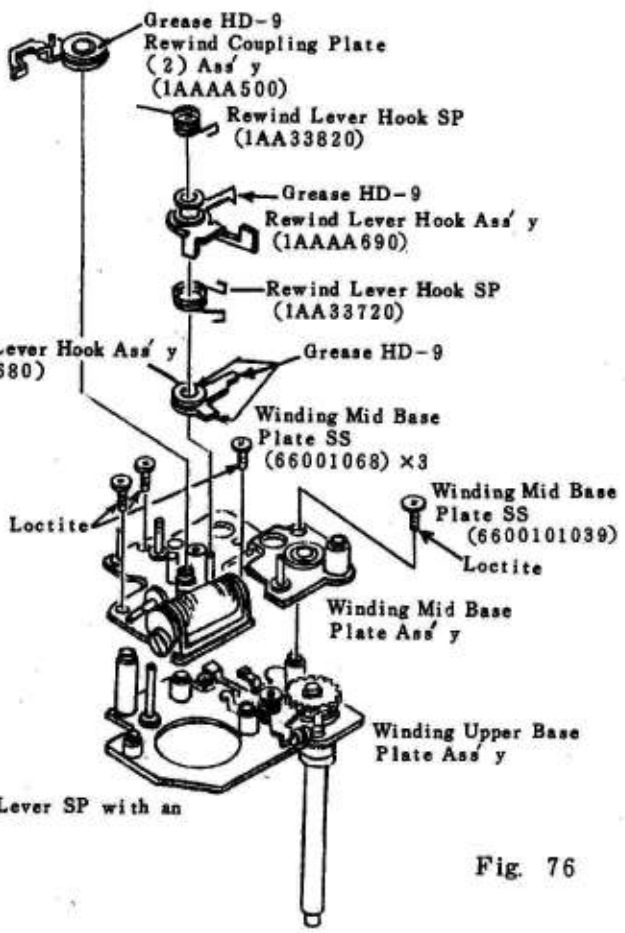
Grease HD-9
Rewind Coupling Plate (2) Ass' y (1AAAA500)
Rewind Lever Hook SP (1AA33820)
Grease HD-9
Rewind Lever Hook Ass' y (1AAAA690)
Rewind Lever Hook SP (1AA33720)
Release Lever Hook Ass' y (1AAAA680)
Grease HD-9
Winding Mid Base Plate SS (66001068) ×3
Loctite
Winding Mid Base Plate SS (6600101039)
Loctite
Winding Mid Base Plate Ass' y
Winding Upper Base Plate Ass' y

Fig. 76

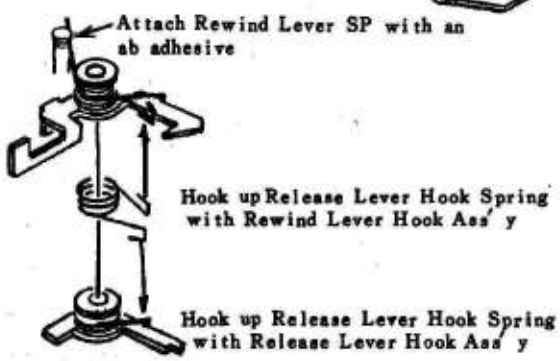
Attach Rewind Lever SP with an ab adhesive
Hook up Release Lever Hook Spring with Rewind Lever Hook Ass' y
Hook up Release Lever Hook Spring with Release Lever Hook Ass' y

Fig. 77

13. Install the Rewind Lever Hook Spring (1AAAA690), hook up the both ends with Rewind Lever Hook Ass' y and the post respectively and attach with an adhesive (Cemedine 551A). (See Fig. 77)
14. Install the Rewind Coupling Plate (2) Ass' y (1AAAA500).

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15. Install the Rewind Coupling Plate (1) Ass' y to the Winding Unit Sub Ass' y.

Note : After install the Rewind Lever Ass' y (1AAAA560) to the Rewind Coupling Plate (1) Ass' y (1AAAC320), fit it to the Winding Unit Sub Ass' y. (See Fig. 79)

① Hook the Rewind Coupling Plate Spring (1AA37830) with the Rewind Lever Ass' y····· ⓐ.

② Install the Rewind Coupling Plate (1) Ass' y to the Rewind Lever Ass' y, and secure it with the E Ring (66101225).

③ Hook the Rewind Coupling Plate Spring with the Rewind Coupling Plate (1) Ass' y····· ⓑ.

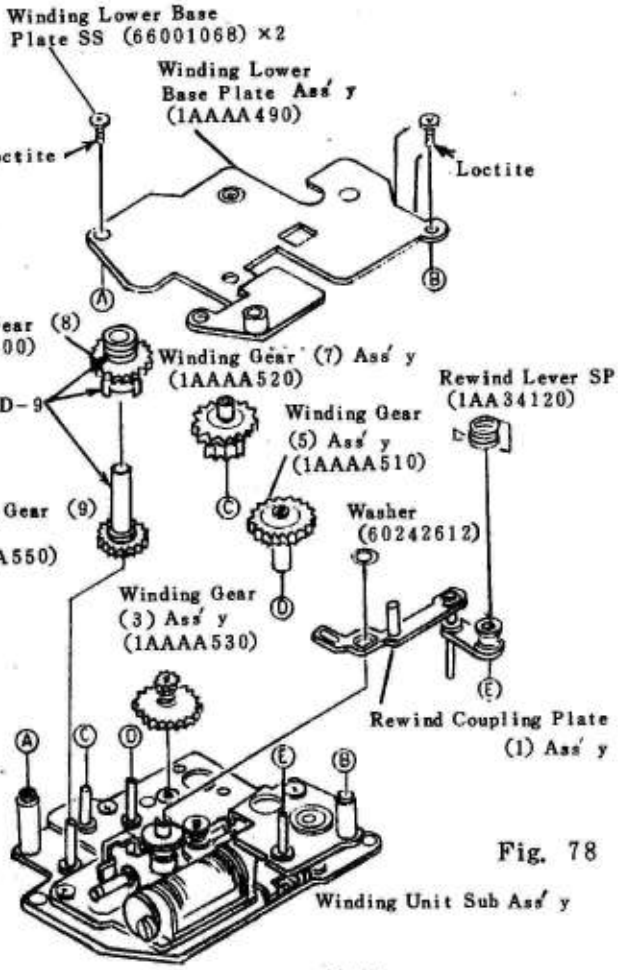
Winding Lower Base Plate SS (66001068) ×2
Winding Lower Base Plate Ass' y (1AAAA490)
Loctite
Loctite
Winding Gear (8) (1AA31400)
Winding Gear (7) Ass' y (1AAAA520)
Rewind Lever SP (1AA34120)
Grease HD-9
Winding Gear (5) Ass' y (1AAAA510)
Winding Gear (9) Ass' y (1AAAA550)
Washer (60242612)
Winding Gear (3) Ass' y (1AAAA530)
Rewind Coupling Plate (1) Ass' y
Winding Unit Sub Ass' y

Fig. 78

16. Install the Rewind Lever Spring (1AA34120). (See Fig. 80)

17. After fitting the Winding Gear (8) (1AA31400) and the Winding Gear (9) Ass' y (1AAAA550) together, install it to the Winding Unit Sub Ass' y.

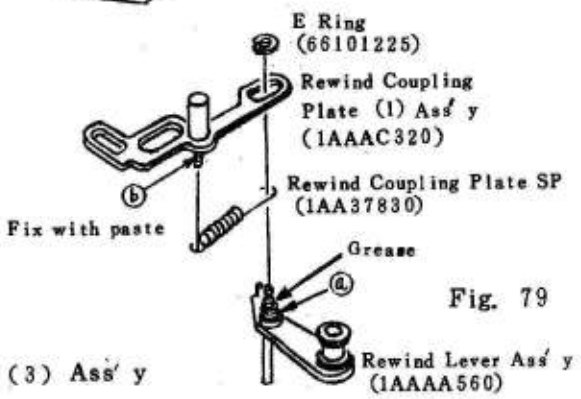
E Ring (66101225)
Rewind Coupling Plate (1) Ass' y (1AAAC320)
Rewind Coupling Plate SP (1AA37830)
Fix with paste
Grease
Rewind Lever Ass' y (1AAAA560)

Fig. 79

18. Install in the order of the Winding Gear (3) Ass' y (1AAAA530), the Winding Gear (7) Ass' y (1AAAA520) and the Winding Gear (5) Ass' y (1AAAA510).

19. Place the Washer (60242612) on the Rewind coupling Plate (1) Ass' y.

20. Install the Winding Lower Base Plate Ass' y (1AAAA490) and secure it with the Winding Lower Base Plate Setscrews (66001068)×2.

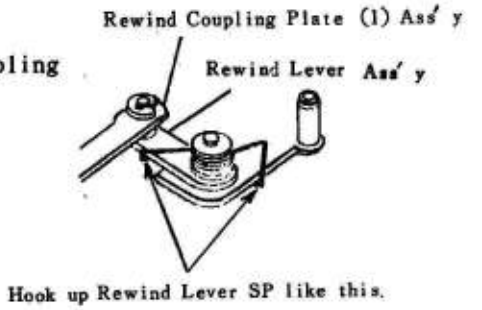

Fig. 80

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21. Install the Clutch Lever Ass' y (1AAAA540) and Secure it with E Ring (66101225).

22. Install the Clutch Lever Down Spring (1AA34710).
Hook up the Clutch Lever Down Spring and aftach it with an adhesive (Cemedine 551A).

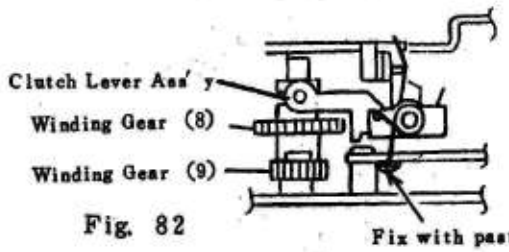

Fig. 82

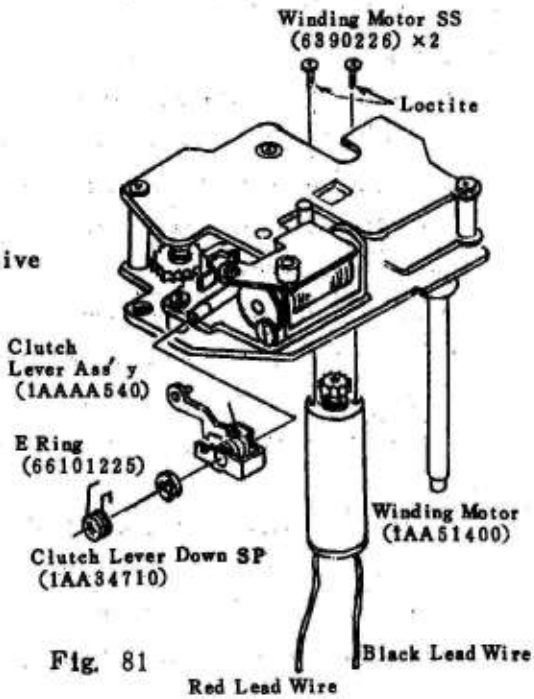

Fig. 81

23. Install the Winding Motor (1AA51400) and secure it with the Winding Motor Setscrews (63902226)×2.
(63902226)×2.

24. Apply Grease HD-9 to each gear. Each gear shall turn smoothly without noise, stumble or unevenness.

[Confirmation of Revolving Limit Switch]

a) During the revolution of the Sprocket shaft, the Revolving Limit Lever and the Revolving Limit Switch shall not be in contact. (See Fig. 83)

b) When the tip of the Revolving Limit Lever goes in by about half deep in the groove of the Sprocket Cam (located under the Sprocket Gear), the Revolving Limit Switch shall be OFF.

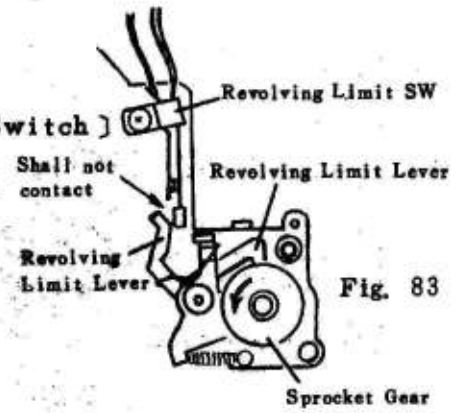

Fig. 83

Fig. 84

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C-1-3 Assembly of Winding Lower Base Plate Ass' y

1. Install the Photo-interrupter (1AA52600) to the Perforation FPC (1AA55900) and solder the five terminals on the Photo-interrupter. Cut off the terminals of the Photo-interrupter.
2. Apply an adhesive (cemedine 551A) to the Winding Photo-interrupter Retainer and fix it to the Photo-interrupter. (See Fig. 85)
3. Install the Winding Encoder Ass' y (1AAAA850) to the Winding Lower Base Plate Sub Ass' y (1AAAA840) and secure it with the E Ring (6610225).
4. Install the Washer (60121810) and PF-FPC Ass' y (1AAAA750), and tighten the PF-FPC Ass' y Setscrew (61911526).

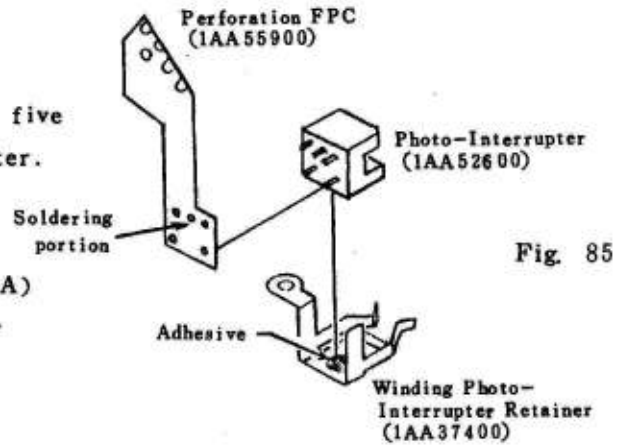

Fig. 85

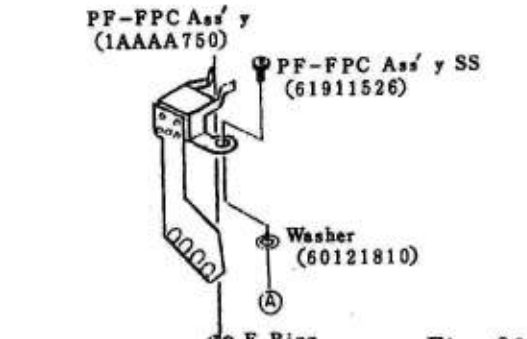

Fig. 86

〔Applying Grease in Sprocket Shaft Ass' y〕

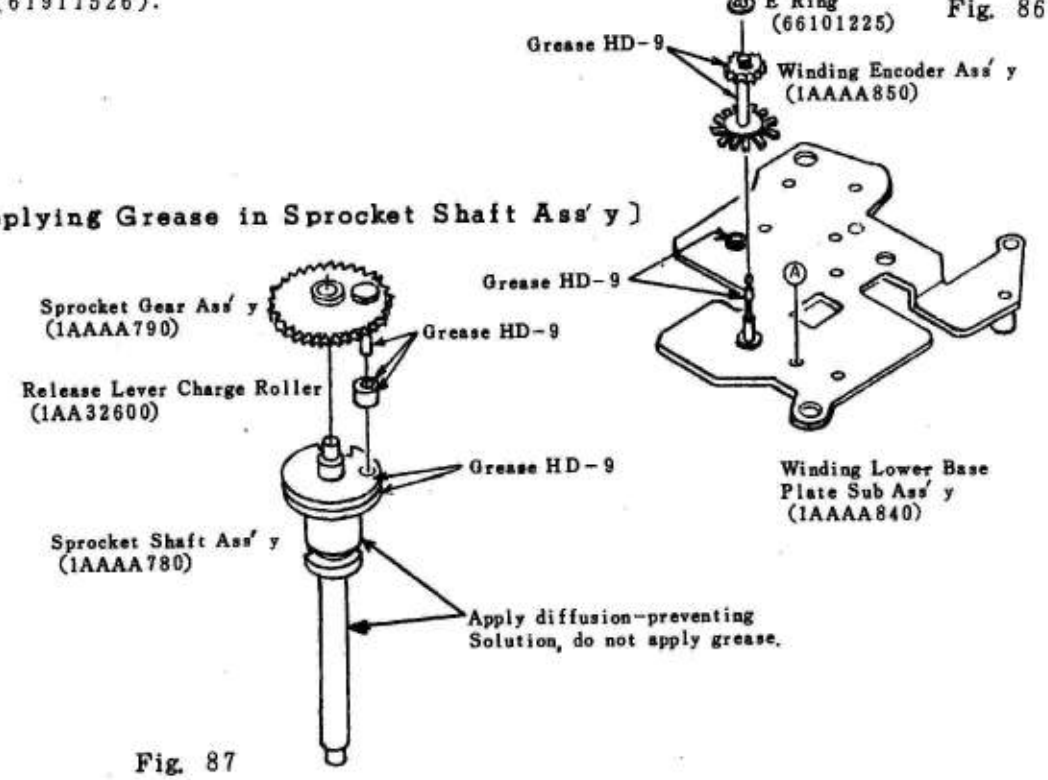

Fig. 87

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C-1-4 Assembly of Rewinding Base Plate Ass' y

1. Install the Cam Board (1AA41800) and Cam Board Setscrews (61901522)×2.
2. Install the Rewind Motor (1AA51300) and secure it with the Rewind Motor Setscrews (61802226)×2.
3. Clean the contacts of the Cam Board Pattern and contact of Cam Gear Ass' y with ether-alcohol, and install the Cam Gear Ass' y (1AAAA950).
4. After installing the Rewind Epicyclic Gear (1) (1AA40800) to the Epicylic Gear Ass' y (1AAAA450), fit it to the Rewind Base Plate (S) Sub Ass' y (1AAAA920).
5. Install the Rewind Gear (1) (1AA40600) and the Rewind Gear (2) (1AA40600).
6. Install the Rewind Gear (4) (1AA43200) to the Rewind Base Plate (L) Ass' y (1AAAA440) and then fit it to the Rewind Base Plate (S) Sub Ass' y.
7. Tighten the Rewind Base Plate (L) Setscrews (61813026)×3.

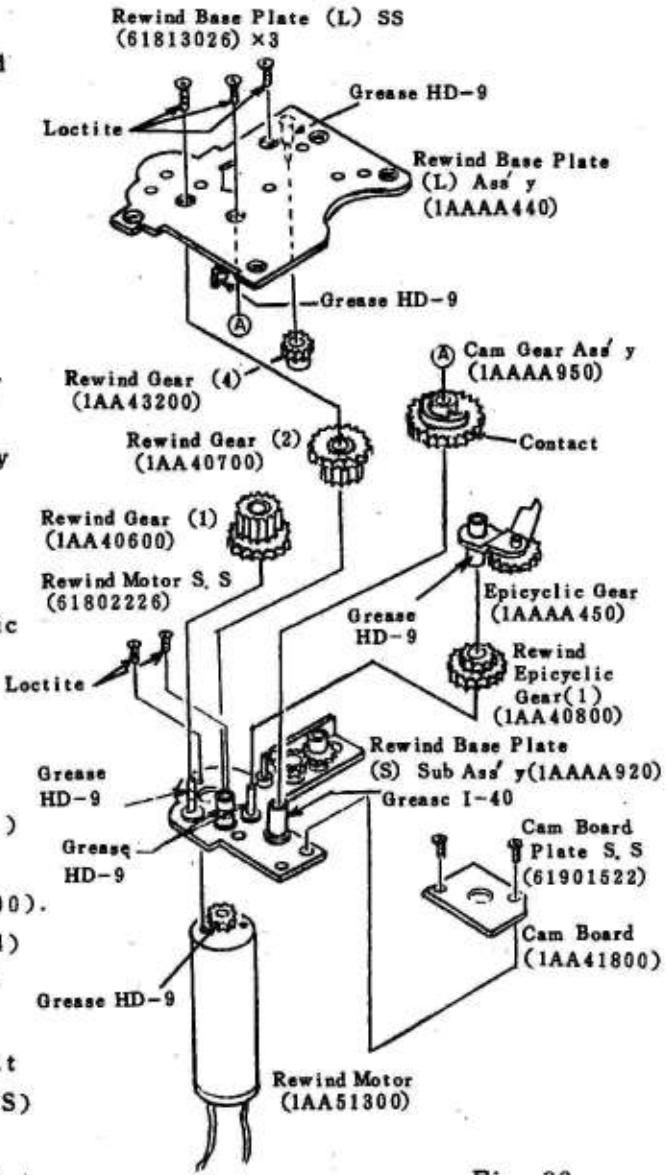

Fig. 88

[Diagram for pasting Acetate Cloth Tape to Rewind Motor]

After repairing the Rewind Motor, paste the Acetate Cloth Tape as illustrated in the Fig. 89 partly wrapping the top of the motor by 3 to 5 mm, in order to prevent possible short-circuting upon contact between the resistors on the Sub FPC and the motor.

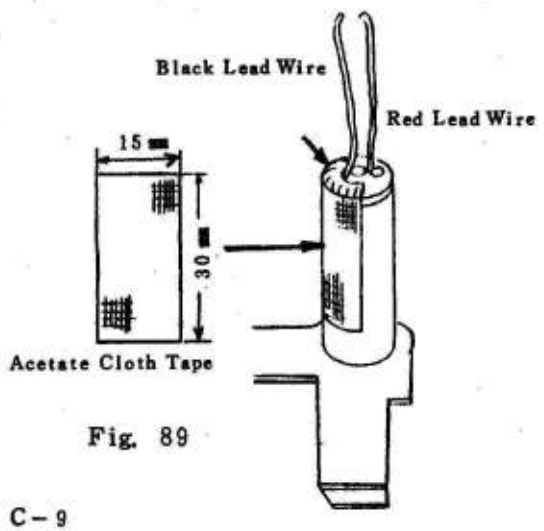

Fig. 89

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C-1-5 Assembly of ISO Dial Base Plate

1. Clean the Drive FPC (1AA55300) Connector with ether-alcohol.
2. Install the Release Base Plate (1) Ass' y (1AA56500), the D Drive FPC and the Counter LCD Holder (1AA28700), and secure them with the Counter LCD Holder Setscrews (61813026)×2.
3. Clean the pattern of the ISO P.C. Board (1AA56300) with ether-alcohol, install the ISO P.C. Board and secure it with the ISO P.C. Board Setscrews (61912026)×2.
4. Solder the Release Base Plate (1) Ass' y and the Drive FPC (6 terminals). Wipe the soldered portion with either-alcohol.
5. Fix the Mylar Films to cover two soldered area on the Drive FPC and the Release Base Plate.
6. Fix the Maylar Films and the Drive FPC with cemedine 551. (See Fig. 91)

Note : a) Apply Loctite to setscrews in the tip (2-3 pitch).

b) Patter of Drive FPC (1AA55300) to be modified, the Maylar Film is discontinued.

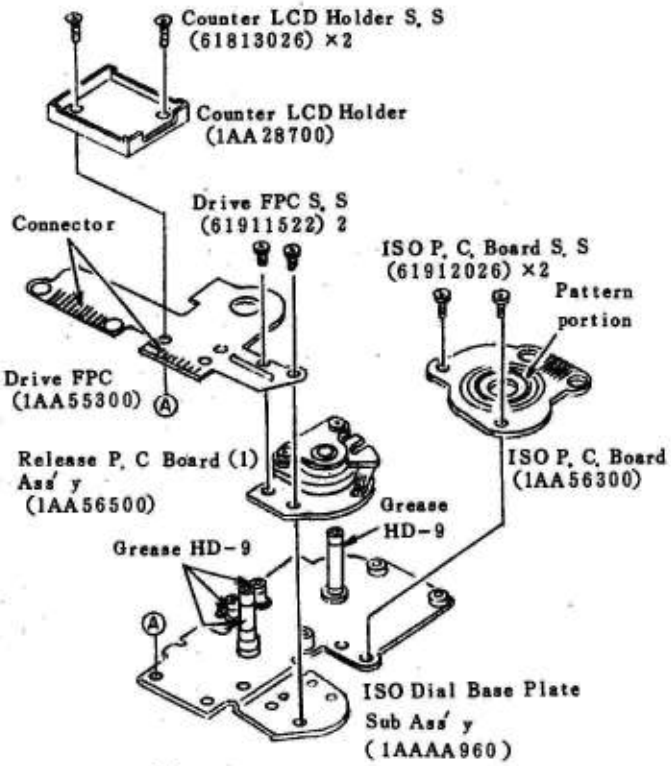

Fig. 90

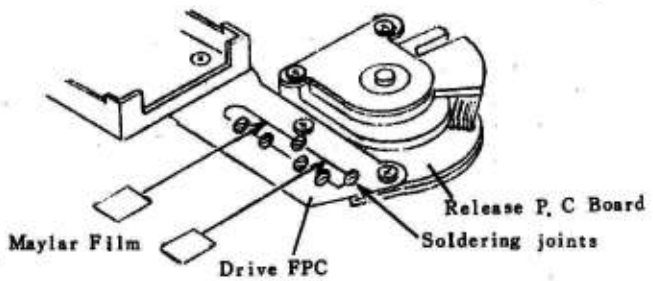

Fig. 91

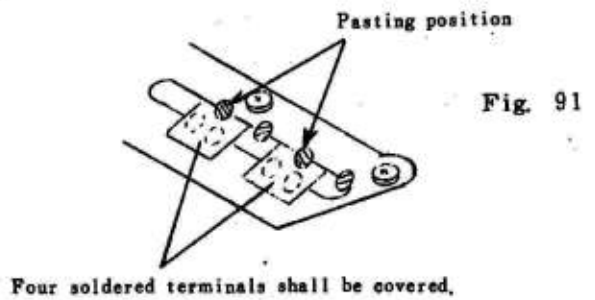

Fig. 91

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7. Clean the Contact of the Drive Mode Contact Plate Ass' y (1AAAA970) and the pattern of the Drive FPC with ether-alcohol, and install the Drive Mode Contact Plate Ass' y.

8. Install the Drive Mode Lock (1AA26510) and secure it with the Drive Mode Lock Setscrew (61813026).

9. Install the Multi-Exp. Return Spring (1AA27910) and the Multi-Exp. Return Gear Ass' y (1AAAA980), and secure it with the Multi-Exp. Return Gear Serscrew (66001068).

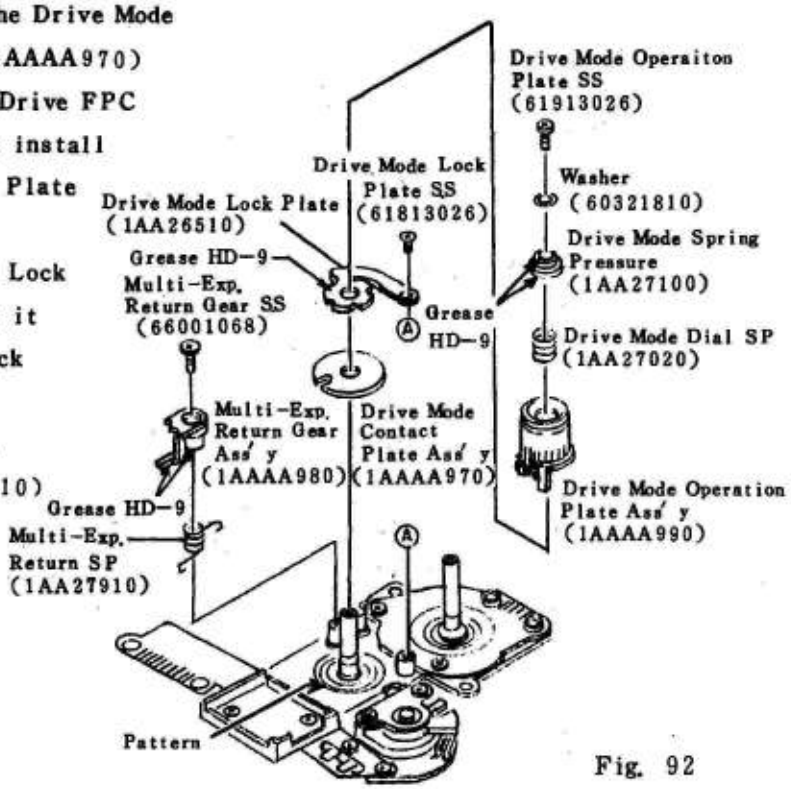
Drive Mode Operaiton Plate SS (61913026)
Washer (60321810)
Drive Mode Lock Plate SS (61813026)
Drive Mode Lock Plate (1AA26510)
Drive Mode Spring Pressure (1AA27100)
Grease HD-9
Multi-Exp. Return Gear SS (66001068)
Grease HD-9
Drive Mode Dial SP (1AA27020)
Multi-Exp. Return Gear Ass' y (1AAAA980)
Drive Mode Contact Plate Ass' y (1AAAA970)
Drive Mode Operation Plate Ass' y (1AAAA990)
Grease HD-9
Multi-Exp. Return SP (1AA27910)
Pattern

Fig. 92

10. Install the Drive Mode Operation Plate Ass' y (1AAAA990), the Drive Mode Dial Spring (1AA27020), Drive Mode Spring Pressure (1AA27100) and the Washer (60321810), and secure them with the Drive Mode Operation Plate Setscrew (61913026).

Notes:

a) Apply Loctite to the setscrews in the tip by 2 to 3 pitch.

b) Hook up the Multi-Exp. Return Gear Spring as in Fig. 93 so that the Multi -Exp. Return Gear Ass' y operates smoothly.

c) The Drive Mode Operation Ass' y shall turn smoothly and each lock shall click properly.

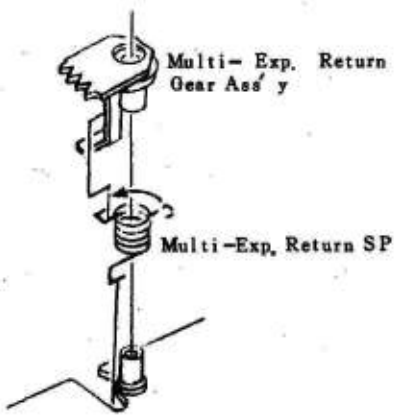

Fig. 93

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11. After cleaning the connector surfaces of the Counter LCD Connector Rubber (1AA58800) and the Counter LCD Panel (1AA51100) with ether-alcohol, install the Counter LCD Connector Rubber and the Counter LCD Panel. Secure them with the Counter LCD Retainer.

Note : a) When mounting the Counter LCD Panel, Place it in the corners of the Counter LCD Holder (see the arrow marks in Fig. 95).

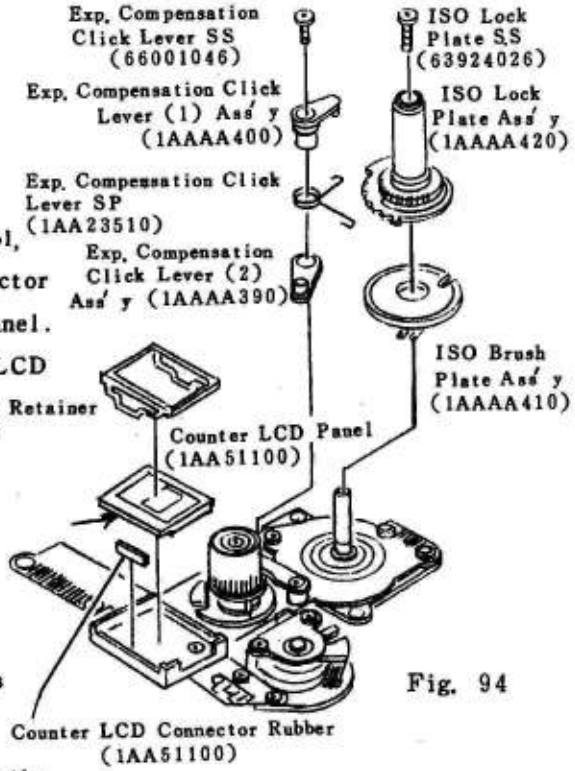
Exp. Compensation Click Lever SS (66001046)
ISO Lock Plate S.S (63924026)
Exp. Compensation Click Lever (1) Ass' y (1AAAA400)
ISO Lock Plate Ass' y (1AAAA420)
Exp. Compensation Click Lever SP (1AA23510)
Exp. Compensation Click Lever (2) Ass' y (1AAAA390)
ISO Brush Plate Ass' y (1AAAA410)
Counter LCD Retainer (1AA28800)
Counter LCD Panel (1AA51100)
Counter LCD Connector Rubber (1AA51100)

Fig. 94

12. After cleaning the contacts of the ISO Lock Plate Ass' y (1AAAA420) and the ISO Brush Plate Ass' y (1AAAA410) with ether-alcohol, install the ISO Lock Plate Ass' y and the ISO Brush Plate Ass' y. Then tighten the ISO Lock Plate Setscrew (63924026).

13. Install the Exp. Compensation Click Lever (2) Ass' y (1AAAA390), the Exp. Compensation Click Lever Spring (1AA23510) and the Exp. Compensation Click Lever (1) Ass' y (1AAAA400), and secure them with the Exp. Compensation Click Lever Setscrew (66001046).

Note : a) Apply Loctite to the setscrews in the tip by 2 to 3 pitch.

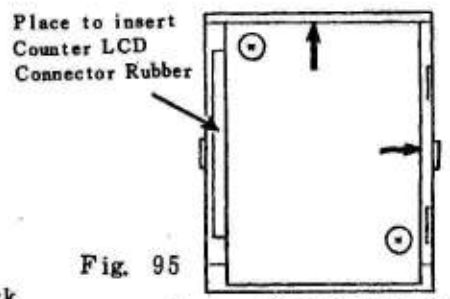

Fig. 95

Upper surface diagram for Counter LCD Holder

Position to apply Grease HD-9 (Upper surface diagram of ISO Lock Plate Ass' y)

Fig. 96

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b) With the ISO Lock Plate Ass' y, the normal / reverse rotation shall occur by a 2 / 3 clicl.

c) The Exp. Compensation Click Lever Spring shall not be in contact with the Multi-Exp. Peturn Gear Ass' y. (See Fig 97)

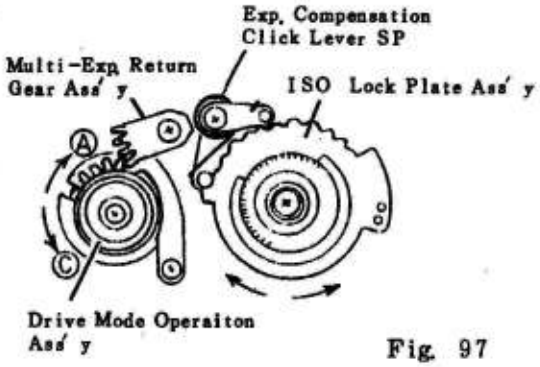


Fig. 97

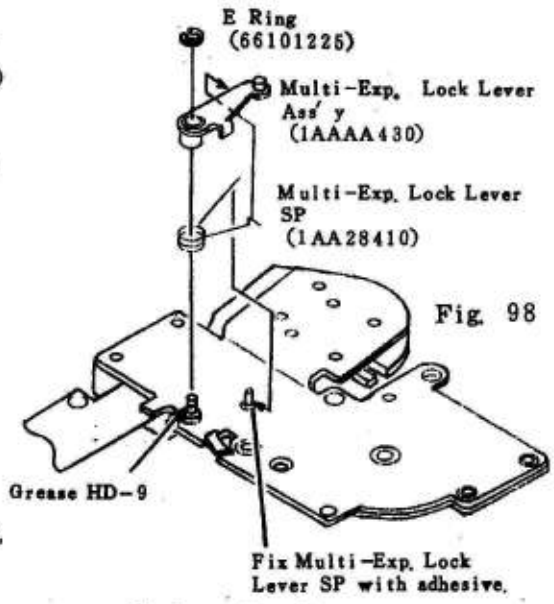
C-1-7 Assembly of Multi-Exp. Lock Lever Ass' y

1. Install the Multi-Exp. Lock Lever Spring (1AA28410) and the Multi-Exp. Lock Lever Ass' y (1AAAA430) into the reverse side of the ISO Dial Base Plate and secure it with the E Ring (66101225).

〔Confirmation of operation〕

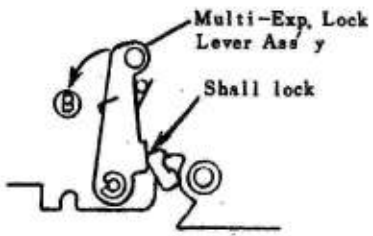
a) The Multi-Exp. Lock Lever Ass' y shall operate smoothly.

b) When the Drive Mode Operation Ass' y is turned from the "single" to the "multi-exp." position (in the direction of Ⓐ in Fig. 97), it shall lock without fail. When the Multi-Exp. Lock Lever Ass' y is turned in the direction of Ⓑ in Fig. 99, the Drive Mode Operation Plate Ass' y shall restore to the "single" position and stop without fail.
And when the Drive Mode Operation Plate Ass' y is turned from the "multi-exp." position in the direction of Ⓒ in Fig. 97, it shall unlock after a slight click sound and restore to the "single" position.


E Ring (66101225)
Multi-Exp. Lock Lever Ass' y (1AAAA430)
Multi-Exp. Lock Lever SP (1AA28410)
Grease HD-9
Fix Multi-Exp. Lock Lever SP with adhesive.

(Under surface diagram of ISO Dial Base Plate)

Fig. 98



(Position at Multi-Exp. Mode)

Fig. 99

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C-1-6 Assembly of Back Cover Lock Cover

1. Push in the Spring Pin (1AA99700) to the Back Cover Lock Knob (1AA17100) and the Back Cover Lock Base (1AA17210).
2. Apply the Grease I-40 to the Back Cover Lock Knob Base and the Back Cover Lock Cover (1AA17000), and install the Back Cover Lock Knob Base.
3. Install the Back Cover Release Lever (1AA17310) and secure it with the Back Cover Release Lever Setscrew (1AA17510).
4. Install the Lock Plate Retaining Lever Spring (1AA17900) and the Lock Plate Retaining Lever (1AA17800).
5. Install the Lock Plate Spring (1AA17700) and the Back Cover Lock Plate Ass' y (1AAAA380).
6. Fix the tip (hook portion) of each spring with an cemedine 551A (four spots). (See Fig. 102)
7. Make sure that the Back Cover Plate operates smoothly without any stumble. Wipe the contact of the Back Cover Lock Plate with ether alcohol.

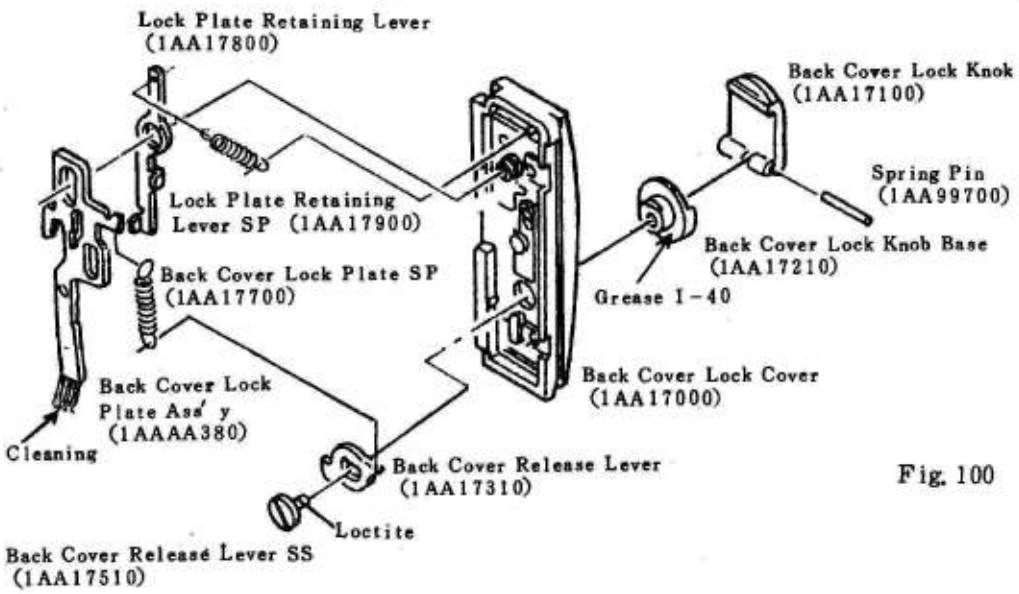
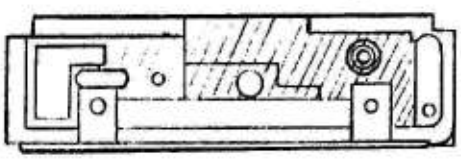

Lock Plate Retaining Lever (1AA17800)
Back Cover Lock Knok (1AA17100)
Spring Pin (1AA99700)
Lock Plate Retaining Lever SP (1AA17900)
Back Cover Lock Knob Base (1AA17210)
Back Cover Lock Plate SP (1AA17700)
Grease I-40
Back Cover Lock Cover (1AA17000)
Back Cover Lock Plate Ass' y (1AAAA380)
Cleaning
Back Cover Release Lever (1AA17310)
Loctite
Back Cover Release Lever SS (1AA17510)

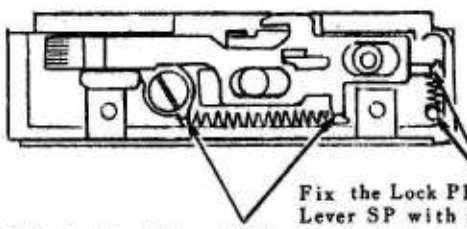
Fig. 100

Fig. 101



Apply Grease I-40 in the shaded area in the Back Cover Lock Cover.

Fig. 102



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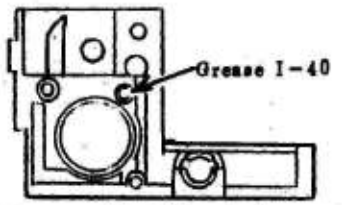
C-1-7 Assembly of Vertical Release Base

1. Insert the Main Switch Button Spring (1AA24410) to the Vertical Release Knob (1AA39220), install the Vertical Release Button (1AA39000) and secure it with the E Ring.
2. Install the Vertical Release Knob to the Vertical Release Base (1AA39530). Apply the Grease I-40 to the reverse side of the Vertical Release Base and insert the Steel Ball (66701620).
3. Install the Vertical Release Holder Plate (1AA39310) and the Vertical Release Click (1AA39420) to the Vertical Release Knob Ass' y that is jut fit in the Vertical Release Base, and secure it with the Vertical Release Click Setscrew (69113076)×3.
4. Wipe the Vertical Release Click contact and the Release P.C. Board (2) (1AA56610) pattern with ether-alcohol. Place the Release P.C. Board (2) and the Vertical Release Switch Base Plate (1AA39610) from above on the Vertical Release Click, and secure it with the Vertical Release Switch Base Plate Setscrews (69113076)×2.



Reverse side of Vertical Release Base

Fig. 103

Fig. 104

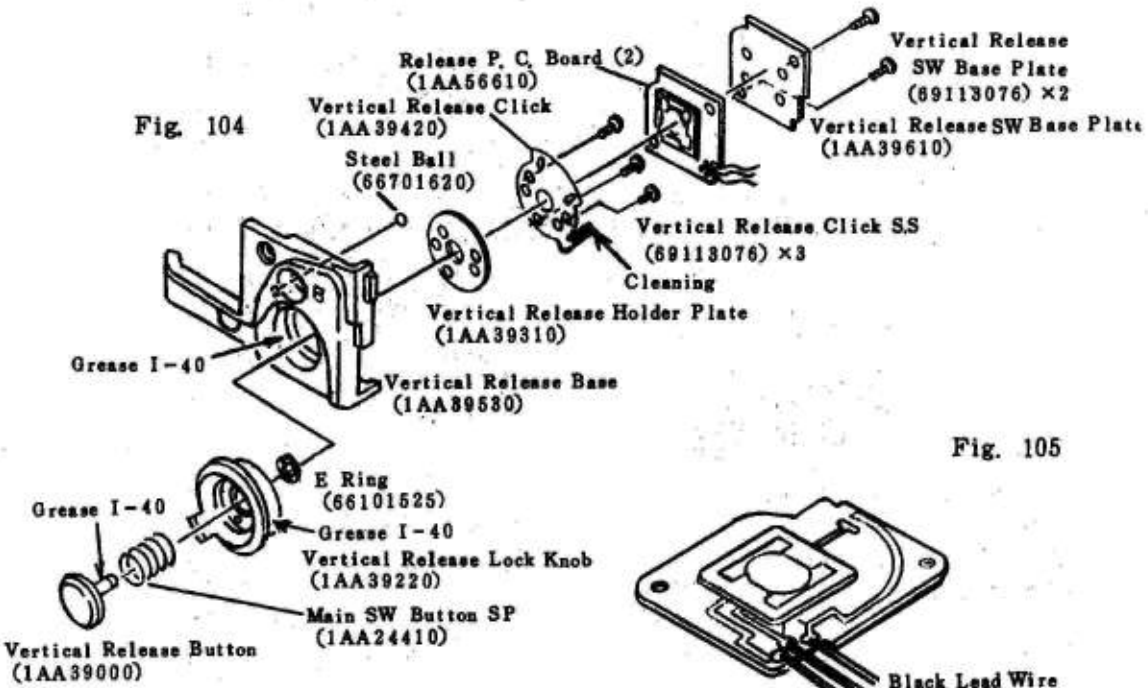
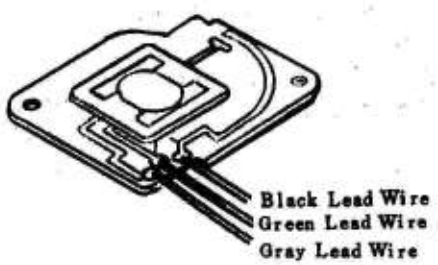


Fig. 105



(Wiring diagram of Release P.C. Board)

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5. Apply Grease I-40 to the Vertical Release Base and the Rewind Knob (1AA29020), insert the Vertical Release Base and install the Rewind Knob Lock Spring (1AA29520) and Rewind Knob Lock Button.

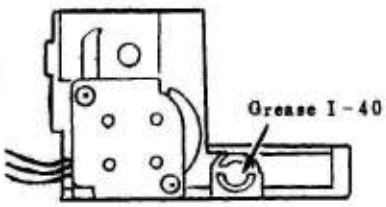

Fig. 106

6. Install the Rewind Knob Operation Plate (1AA29210) from the reverse side of the Vertical Release Base, and secure it with the Operation Plate Setscrew (61903026).
7. Install the Rewind Knob Spring (1AA29410) and the Rewind Knob Return Spring (1AA29320).
   Check if the Rewind Knob operates smoothly.

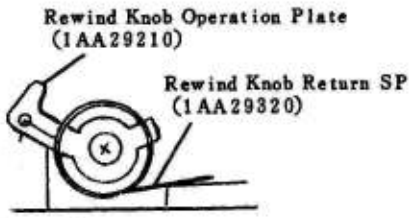

Fig. 107

8. Insert the Bulb Socket (1AA14500), attach the Washer (60223112) under the Vertical Release Base, tighten the First Curtain Brake Nut (13740700) and fix it with an adhesive (cemedine 551A).

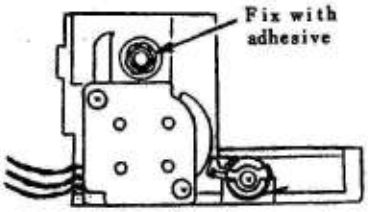

Fig. 108

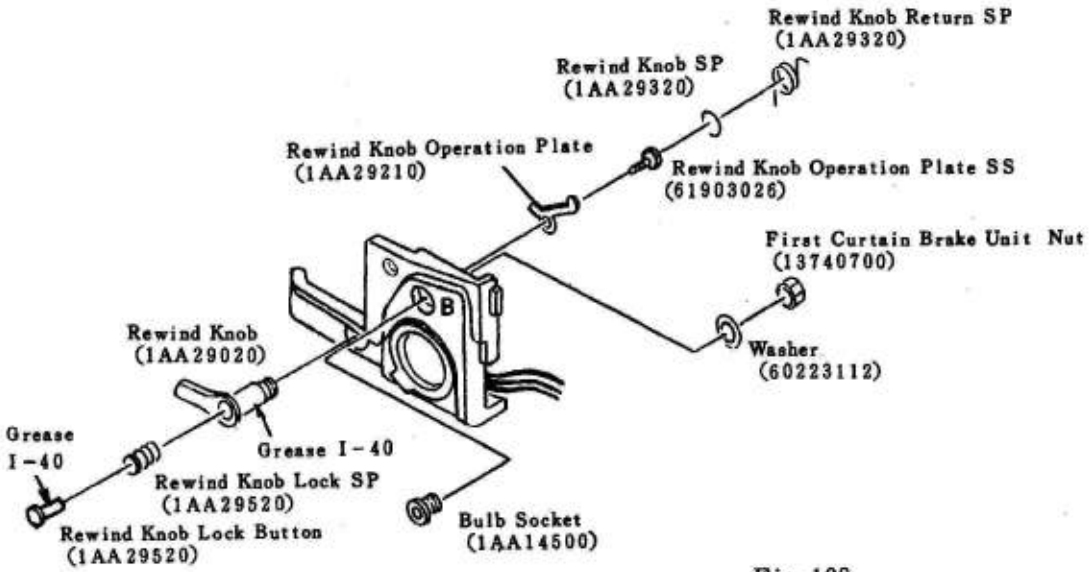

Fig. 109

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C-1-8 Assembly of Penta Prism

1. Turn the Penta Prism (1AA80800) upside down, and place the Penta Prism Spacer (1AA80500) on the Penta Prism.
2. Install in the order of the Condenser Lens (1AA80500), the Viewfinder Frame (A) (1AA80400) and the Penta Prism Holder Ass' y (1AAAB740) onto the Penta Prism Spacer.
3. Raise the Penta Prism Holder Ass' y and remove the Penta Prism.

Notes:

a) The Condenser Lens shall be free from dirt and dust.

b) The Viewfinder Frame (A) shall be housed in position in the Penta Prism Spacer.

c) Make sure the square holes in the Penta Prism Holder Ass' y are in corresponding positions with those in the Viewfinder Frame (A).

4. Bond the Penta Prism Spacer to the Penta Prism Holder Ass' y with epoxy resin adhesive.

Note : a) When applying the epoxy resin adhesive, make sure that the condenser Lens is not covered with the adhesive. Do not use an exceeding amount of adhesives.

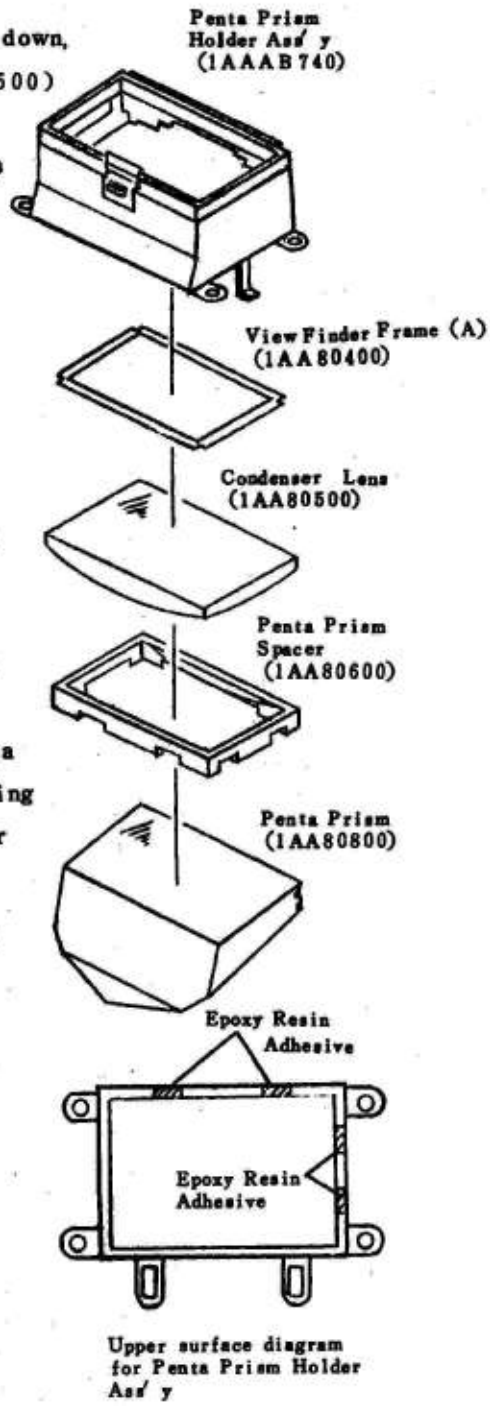
Penta Prism Holder Ass' y (1AAAB740)
View Finder Frame (A) (1AA80400)
Condenser Lens (1AA80500)
Penta Prism Spacer (1AA80600)
Penta Prism (1AA80800)
Epoxy Resin Adhesive
Epoxy Resin Adhesive
Upper surface diagram for Penta Prism Holder Ass' y

Fig. 110

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5. Install the Viewfinder Indicator Prism (A) (1AA81120) to the Penta Prism Holder and glue it with epoxy resin adhesive. (See Fig. 112)
6. Install the Viewfinder Indicator Prism (B) (1AA81200) to the Penta Prism Holder and glue it with epoxy resin adhesive. (See Fig. 113) Apply the Shielder around the Viewfinder Indicator Prism (B). (See Fig. 114)

Note : a) After gluing with epoxy resin adhesive, leave it for 24 hours and install it to the body.

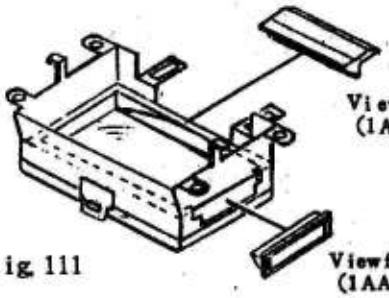

Fig. 111

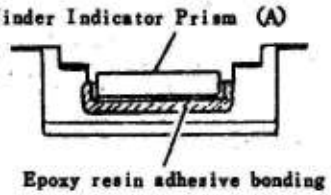

Fig. 112

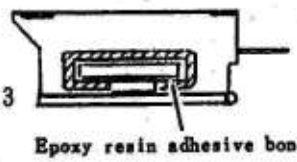

Fig. 113

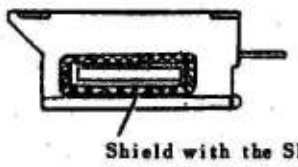

Fig. 114

7. Follow in the reverse order of the procedure B-23.
8. After cleaning the Penta Prism Ass' y and the Focusing Screen. insert the Focusing Screen.
9. Stick the Dust-Proof Tape (1AA69900).
10. Apply the Shielder in a gap between the Penta Prism Holder and the Penta Prism.

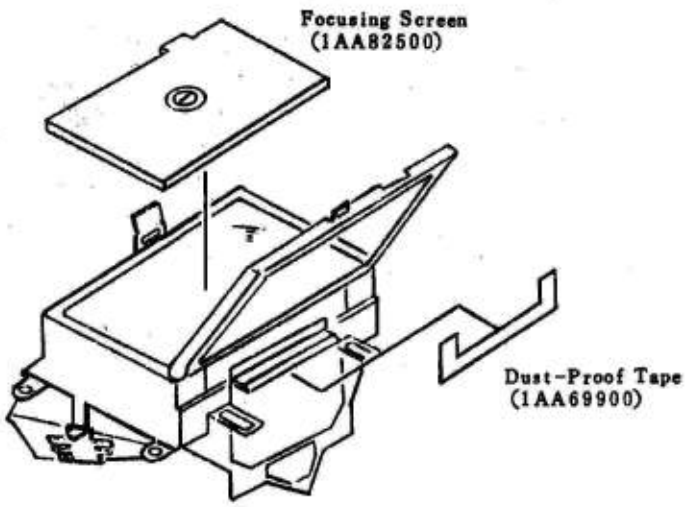

Fig. 115

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C-1-9 Assembly of Viewfinder Indicator (B)

1. Fix th Inner EL Adhesive Tape (1AA81500) to the Viewfinder Indicator Holder (B) (1AA81700).
2. Peel off the backing paper of the Inner EL Adhesive Tape, slide the S-EL (1AA50800) in the direction of the arrow and fix it.
3. Fix the Inner LCD Adhesive Tape (1AA81600) onto the S-EL.
4. Peel off the backing paper of the Inner LCD Adhesive Tape and the protection tape of the S-LCD Panel (1AA50700), slide it in the direction of the arrow and fix it on the Inner LCD Adhesive Tape.

Notes:

a) After Peeling off the protection tape of the S-LCD Panel, do not touch it with fingers.

b) Pay attention to the S-LCD Panel whether it is on the surface or the reverse side.

5. Peel off the protection tape on the surface of the S-LCD Panel and install the Viewfinder Indicator Holder (B) (1AA81800).
6. Tighten lightly the Viewfinder Indicator Adjustment Screws (1AA82000)×2 into the Viewfinder Indicator Base (1AA81900). And secure them until the gep is about 1 ㎜. (See Fig. 119 ①)

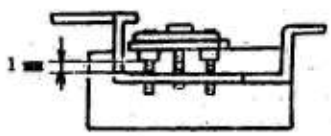

Fig. 119 ①

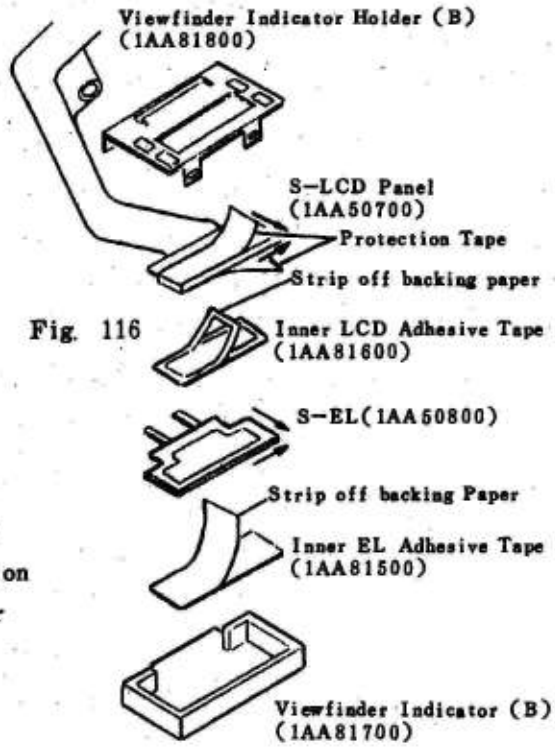

Fig. 116

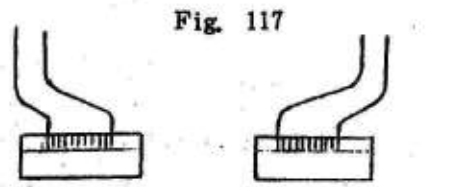

Fig. 117

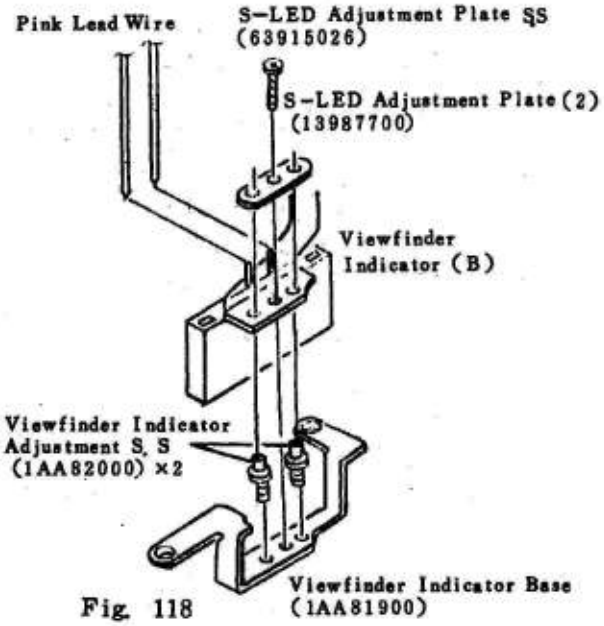

Fig. 118

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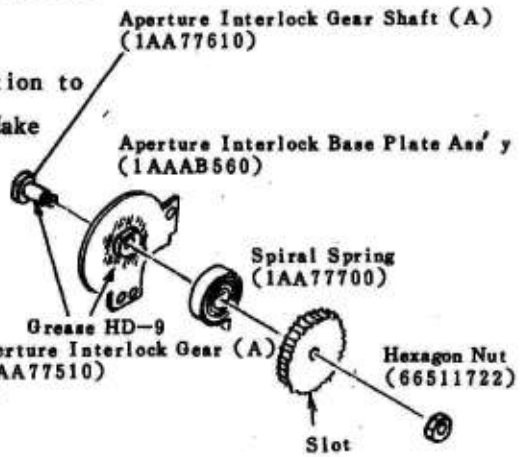
7. Install the Viewfinder Indicator (B) to the Viewfinder Indicator Base, place the S-LED Adjustment Plate (2) (13987700) on it and secure it with the S-LED Adjustment Plate Setscrew.
8. Solder the two Pink Lead Wires to the S-EL.

C-1-10 Assembly of Aperture Code Ass' y

1. Apply the Grease HD-9 to the Aperture Interlock Base Plate Ass' y (1AAAB560), and install the Spiral Spring (1AA77700) and the Aperture Interlock Gear (A) (1AA77510).

Fig. 119 ②



Note : a) Pay attention to the position to mount the Spiral Spring. Make sure that the tip of the Spiral Spring in Fig. 120 is engaged with the slot of the Aperture Interlock Gear (A).

2. Install the Aperture Interlock Gear Shaft (A) (1AA77610) to the Aperture Interlock Base Plate Ass' y and secure it with the Hexagon Nut (66511722).
3. Install the Aperture P.C Board (1AA56900) and the Aperture Interlock Base Ass' y (1AAAB570) to the Aperture Interlock Base Plate Ass' y and secure it with the Aperture Interlock Base Setscrew (66001050).

Fig. 120

The tip of this shall engage with the slot of Aperture Interlock Gear A.

Notes:

a) Clean the Aperture P.C Board pattern and the contact of the Aperture Interlock Base Ass' y with ether-alcohol.

b) Do not deform the contact of the Aperture Interlock Base Ass' y.

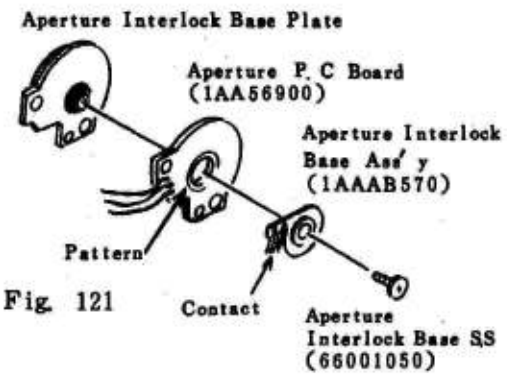


Fig. 121

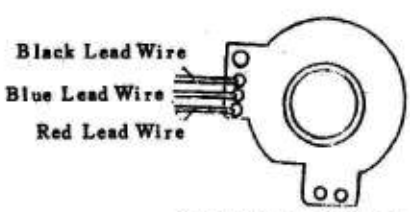


Fig. 122

(Aperture P. C Board diagram)

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C-1-11 Assembly of Mirror Up Ass' y

1. Apply the Grease HD-9 to the Mirror Up Knob (1AA937300), install it to the Mirror Up Base Plate Ass' y (1AAAB580), Place the Mirror Up Cam (1AA93810) and secure it with the Mirror Up Knob Setscrew (1AA93810).

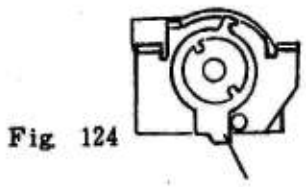

Fig. 124

Diagram for Mirror Up Cam positioning

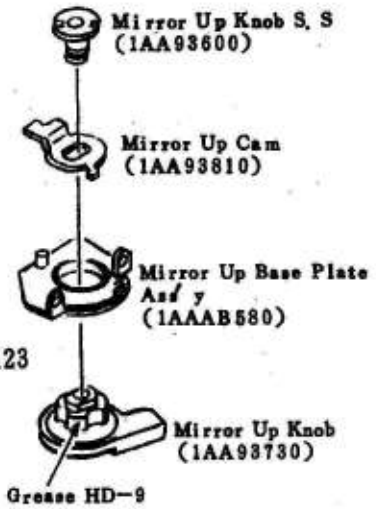

Fig. 123

2. Insert the Lens Lock Button Spring (1AA94000) to the Lens Lock Button (1AA93900), install it to the Mirror Up Base Plate Ass' y and secure it with the E Ring (66101225).
3. Hook up the Mirror Up Click Spring (1AA93510) with the Mirror Up Base Plate Ass' y and the Mirror Up Cam, and fix the two connecting points with an adhesive (cemedine 551A).

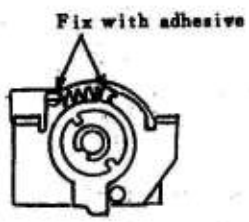

Fig. 126

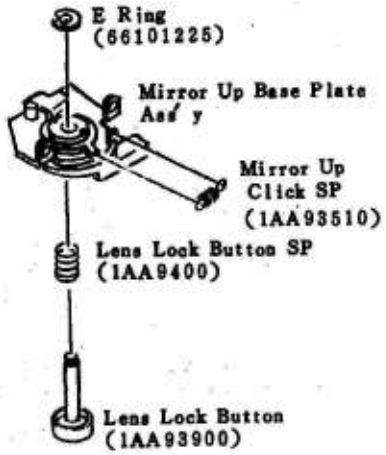

Fig. 125

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C-1-12 Assembly of Metering Change Base Plate Ass' Y

1. Apply the Grease HD-9 to the Metering Change Knob (1AA92320) and the Metering Change Base Plate Ass' y (1AAAB590), and install the Metering Change Knob to the Metering Change Base Plate Ass' y.
2. Place the Steel Ball on the Metering Change Base Plate Ass' y, put over it the Metering Change Plate Sub Ass' y (1AAAB600) and secure it with the Mirror Up Knob Setscrew (1AA93600).
3. Insert the Lens Lock Spring (1AA94010) to the Lens Lock Button (1AA93900), install it to the Metering Change Base Plate Ass' y and secure it with the E Ring (66101225).

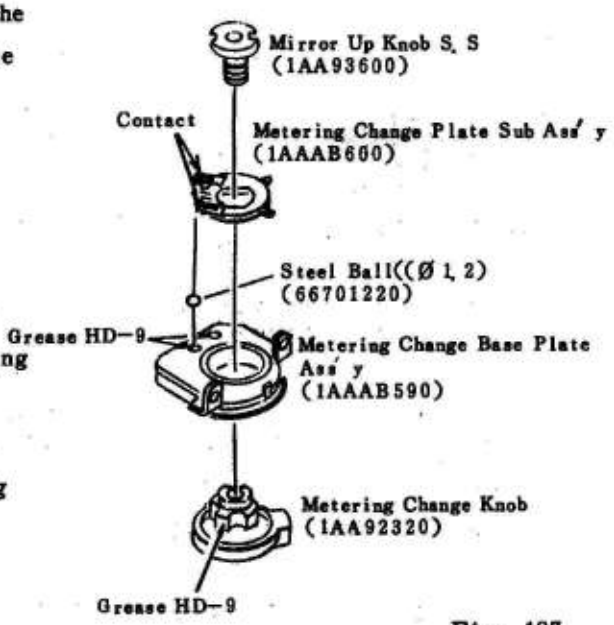

Fig. 127

Notes:

a) Do not deform the contract of the Metering Change Plate Sub Ass' y. When the contact pressure is weak, a continuity malfunction may occur. If so, modify it by bending as in Fig. 129.

Fig. 129

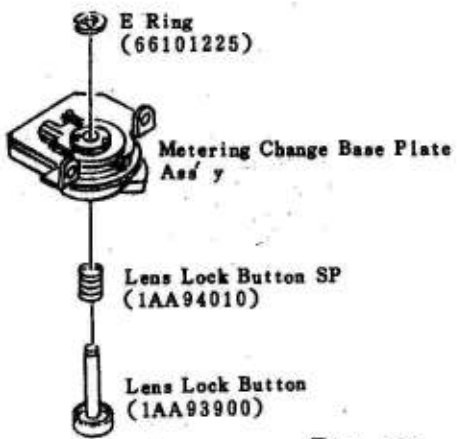

Fig. 128

b) Make sure that you feel the clicks when the Metering Change Knob is operated. If there is no click, correct it by pressing down the tip of the Metering Change Click Plate with tweezers.

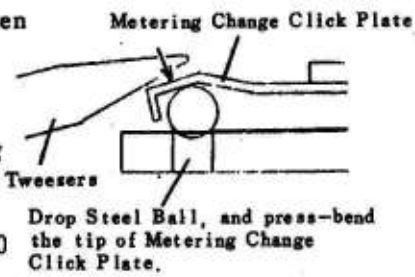

Fig. 130

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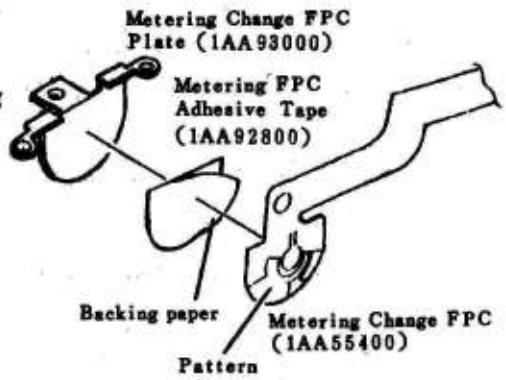
C-1-13 Assembly of Metering Change FPC Ass' y

Fig. 131

1. Fix the Metering FPC Adhesive Tape to the Metering Change FPC Plate (1AA93000), peel off the backing paper of the Metering FPC Adhesive Tape and paste it to the Metering Change FPC (1AA55400).



Note : a) Wipe the pattern of the Metering Change FPC (1AA55400) with ether-alcohol.

2. Install the Preview Switch (1AA92900) to the Metering Change FPC Plate and secure it with the Preview Swith Setscrew (61911826).

Note :

a) Wipe the Preview Switch (1AA92900) with ether-alcohol.

b) Install the Preview Switch in parallel with the Metering Change FPC.

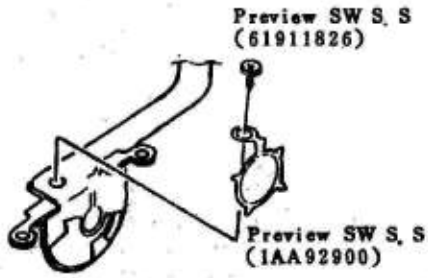


Fig. 132

C-1-14 How to fix moquette used to prevent light leakage in Spot Metering Ass' y

After repairing the Spot Metering Ass' y by replacing it a new, fix the M. Moquetts (1AA67810)×2 and the Mirror Light-Proof Moquette (1AA67700).

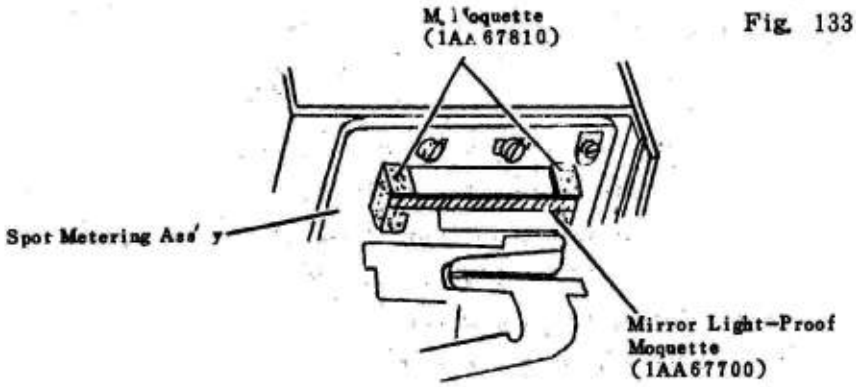


Fig. 133

(Spot Metering portion in Mirror Box)

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C-1-15 Assembly of Mount Base Ass' y

1. Insert Ⓐ of the open signal FPC from the side Ⓐ in the Mount Base and install the Aperture Ring of the Aperture Ring Plate Ass' y (1AAAB370) in the direction indicated by the arrow Ⓑ (open direction).
2. Tighten the Aperture Ring Plate Ass' y Setscrews (61912522)×6. (See Fig. 134)

Notes : a) Move to the left (in the direction of the arrow Ⓒ) and install the Aperture Ring Plate Ass' y, and tighten the Aperture Ring Plate Ass' y Setscrews in the order of Ⓘ through ⑥. (See Fig. 134)

b) Check to make sure that all the rings of the Aperture Ring Plate Ass' y move evenly and smoothly.

c) Take care not to scratch the Ⓓ part of the Mount Base. (See Fig. 134)

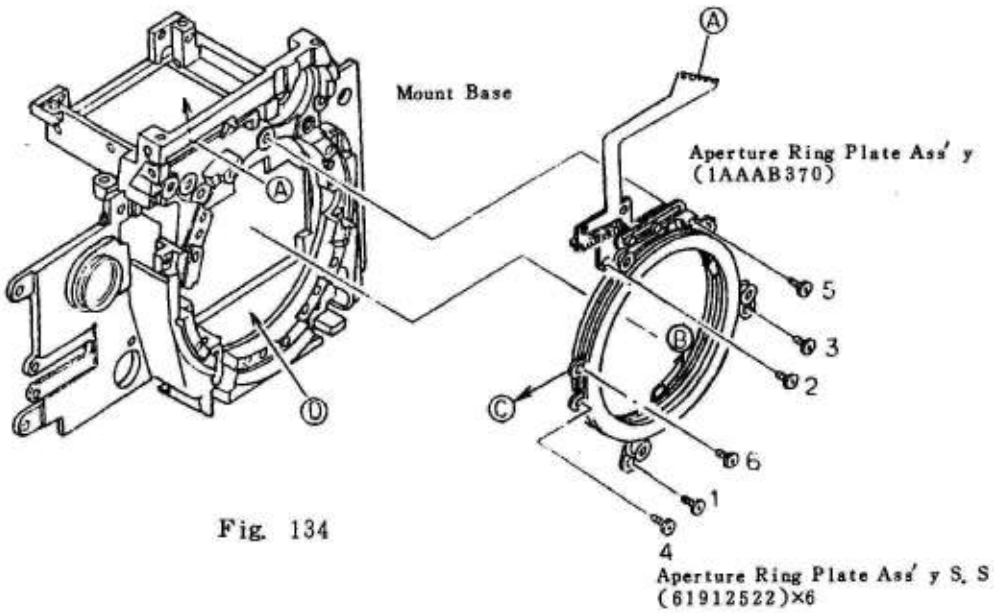

Fig. 134

3. Set the Aperture Interlock Ring in the direction indicated dy the arrow Ⓐ (open direction). (See Fig. 136)
4. Rotate both the Aperture Interlock Gear (A) of the Aperture Code Ass' y (1AAAB360) and the claw Ⓑ to be engaged with the Spiral Spring for approximately 300 degrees, install it to the Mount Base and secure it with the Aperture Code Ass' y Setscrews (61913026)×2. (See Fig. 135)
5. Set the contact of the Aperture Interlock Contact Base in the Aperture Code Ass' y onto the second contact of the pattern in the Aperture Code, and tighten firmly the Aperture Interlock Base Ass' y Setscrew (66001050). (See Fig. 137)

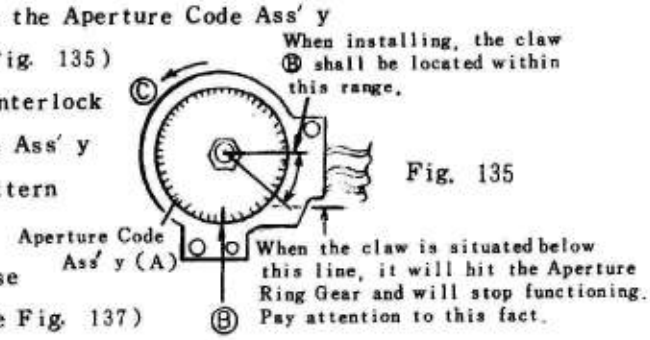
When installing, the claw Ⓑ shall be located within this range.
Ⓒ
Aperture Code Ass' y (A)
When the claw is situated below this line, it will hit the Aperture Ring Gear and will stop functioning. Pay attention to this fact.
Ⓑ

Fig. 135

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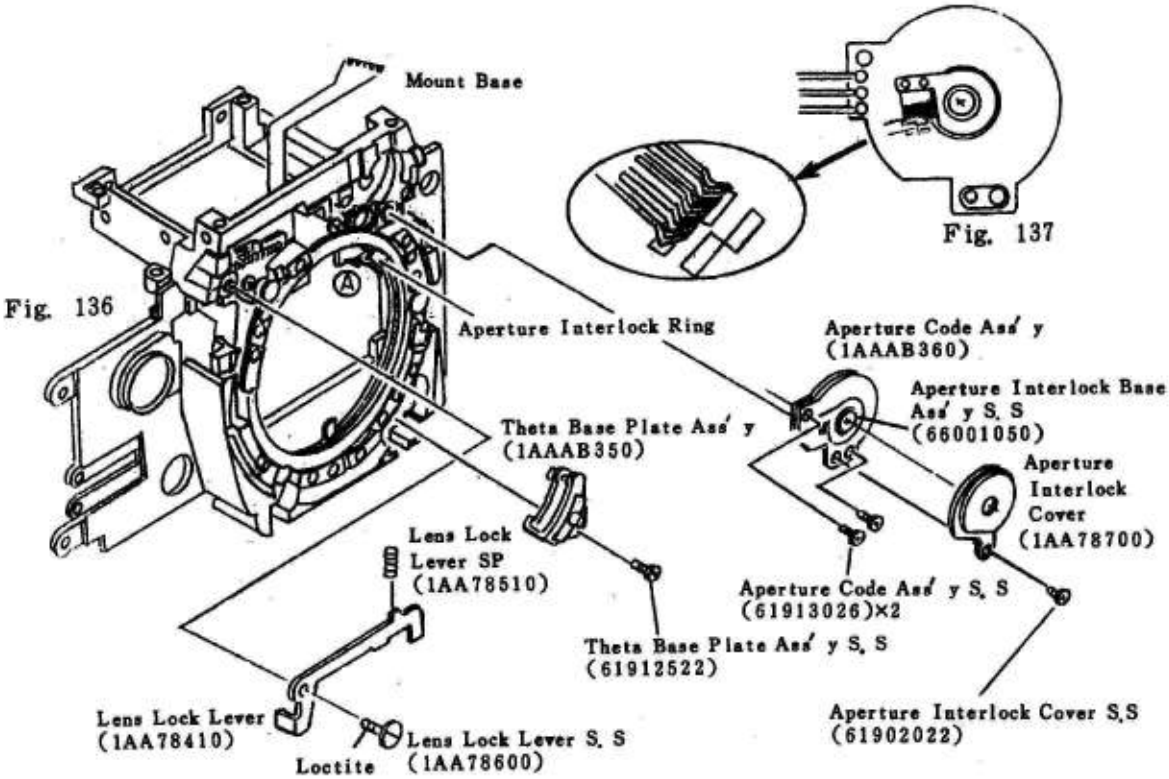

Fig. 136

Fig. 137

6. Install the Theta Base Plate Ass' y (1AAAB350) and secure it with the Theta Base Plate Ass' y Setscrew (61912522).
7. Install the Lens Lock Lever (1AA78410) and secure it with the Lens Lock Lever Setscrew (1AA78600). Set the Lens Lock Lever Spring (1AA78510).

Note : a) Apply Loctite on about 1.5 pitches of thread of the Lens Lock Lever Setscrew. Pay attention to the amount of Loctite so that Loctite used does not overflow.

8. Install the Mirror Up Base Plate Ass' y and secure it with the Mirror Up Base Plate Setscrew (61913026)×2. (See Fig. 138)
9. Install the Metering Change Base Plate Ass' y and the Metering Change FPC Ass' y, and secure them with the Metering Change FPC Plate Setscrews (61913026)×2.

Notes:

a) When installing the Metering Change FPC Ass' y, do not deform the contact of the Metering Change Base Plate Ass' y.

b) Make sure that the Lens Lock Lever operates properly when the Lens Lock Button is depressed.

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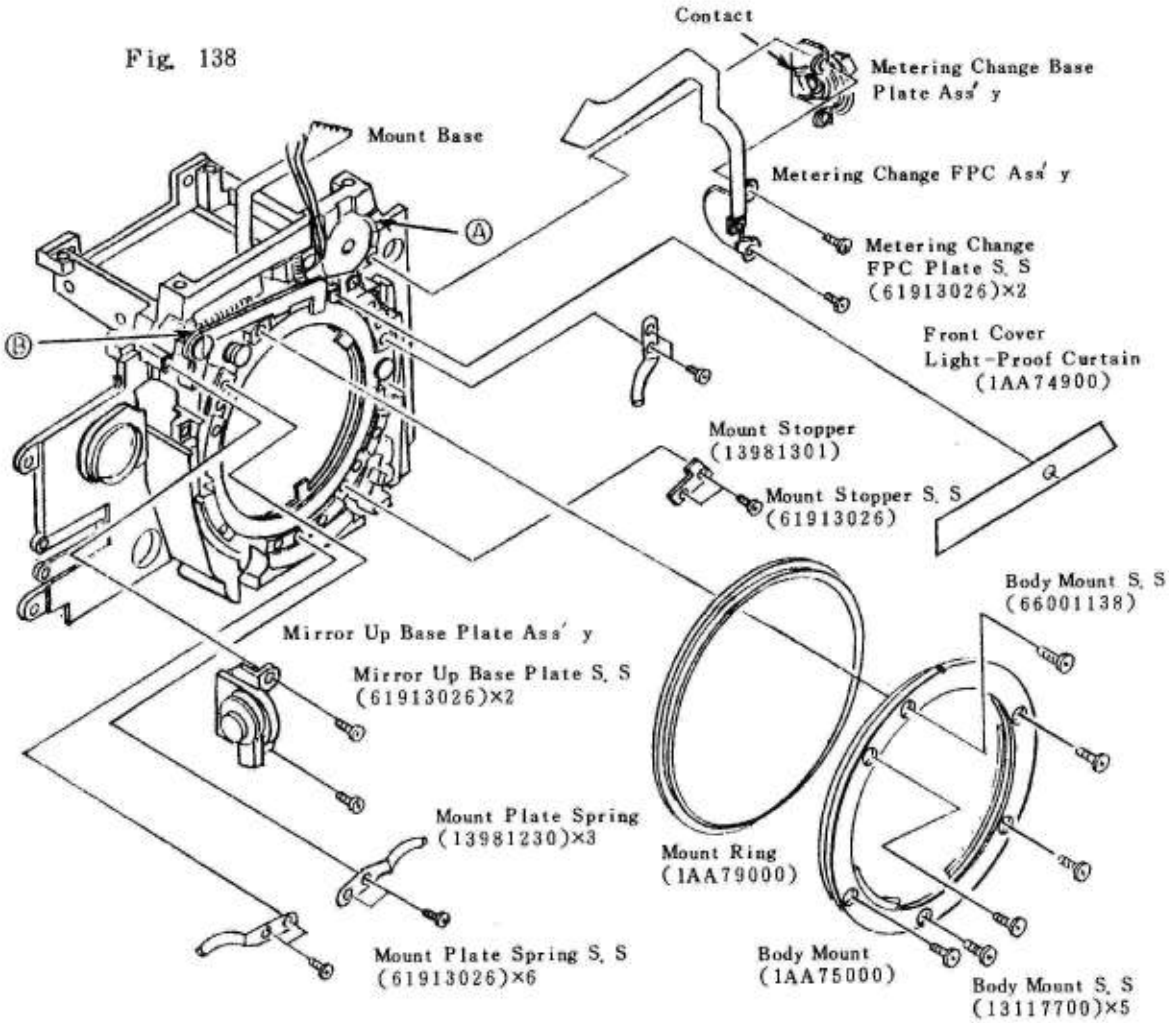
Fig. 138


Contact
Metering Change Base Plate Ass' y
Mount Base
Metering Change FPC Ass' y
Ⓐ
Metering Change FPC Plate S. S (61913026)×2
Ⓑ
Front Cover Light-Proof Curtain (1AA74900)
Mount Stopper (13981301)
Mount Stopper S. S (61913026)
Q
Body Mount S. S (66001138)
Mirror Up Base Plate Ass' y
Mirror Up Base Plate S. S (61913026)×2
Mount Plate Spring (13981230)×3
Mount Ring (1AA79000)
Mount Plate Spring S. S (61913026)×6
Body Mount (1AA75000)
Body Mount S. S (13117700)×5

9. Install the Mount Stopper (13981201) to the Mount Base and secure it with the Mount Stopper Setscrews (61913026).
10. Install the Mount Plate Springs (13981230)×3 and tighten the Mount Plate Spring Setscrews (61913026).
11. Install the Mount Ring (1AA79000), place upon it the Body Mount (1AA75000) and secure it with the Body Mount Setscrews (13117700) ×5, (66001138).

Note : a) Make sure to install the correct side of the Mount Ring to the Body Mount. (See Fig. 139)

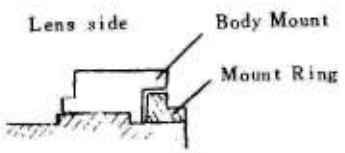


Fig. 139

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12. Adjust the contact position the Open F. Stop Signal Code Base Plate

〔Adjustment procedure〕

① Mount the Planar 1.4/50㎜ lens on the body mount.

② Set the lens aperture to F1.4.

③ Loosen the Open Signal FPC Setscrews (62901520)×2.

④ Move the Open F. Stop Signal FPC to adjust so that the Open F. Stop Signal Contact is positioned on the pattern of the Open F. Stop Signal FPC. (See Fig. 140)

⑤ Tighten the Open F. Stop Signal FPC Setscrew.

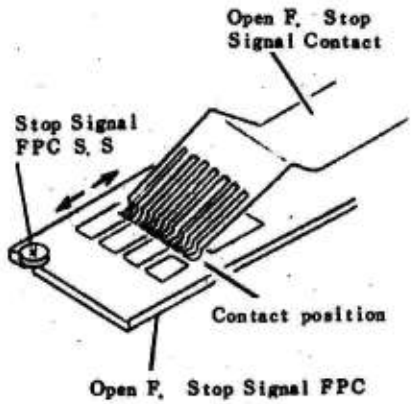


Fig. 140

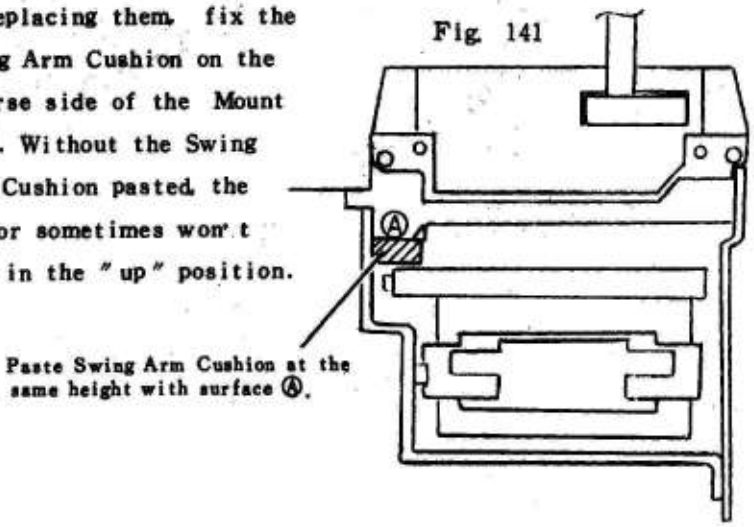
13. Apply an adhesive (Cemedine 551A) at Ⓐ and Ⓑ on the Mount Base and fix the Front Cover Light-Proof Curtain (1AA74900). (See Fig. 138)

Note : a) Use the Ø boss on the Mount Base as the guide.

〔Position to paste Swing Arm Cushion〕

Note : a) After repairing the Mount Base Ass' y and the Mirror Box Ass' y by replacing them, fix the Swing Arm Cushion on the reverse side of the Mount Base. Without the Swing Arm Cushion pasted, the Mirror sometimes won't stay in the "up" position.

Fig. 141



(Reverse side of Mirror Box Ass' y)

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C-1-16 How to hook Springs of Mirror Box Side

1. Install the 45° Adjustment Base Plate (B) Ass' y (1AAAB250) to the Mirror Box Base Plate.
2. Place the 45° Spring (A) (1AA63600) and hook its Ⓐ and Ⓑ part with ⓐ and ⓑ respectively.
3. Pass the Sub Mirror Spring (1AA61010) through the reverse side of the Swing Arm and put it in the gap of the Sub Mirror Snap Pin. Hook the Ⓒ and Ⓓ part of the Sub Mirror Spring with Ⓒ and ⓓ respectively. Secure it with the Spring Setscrew (1AA63700).
4. Install the 45° Spring (B) and hook the Ⓔ and Ⓕ part of the 45° Spring with ⓔ and ⓕ respectively. Secure it with the Spring Setscrew (1AA63700).

Fig. 142

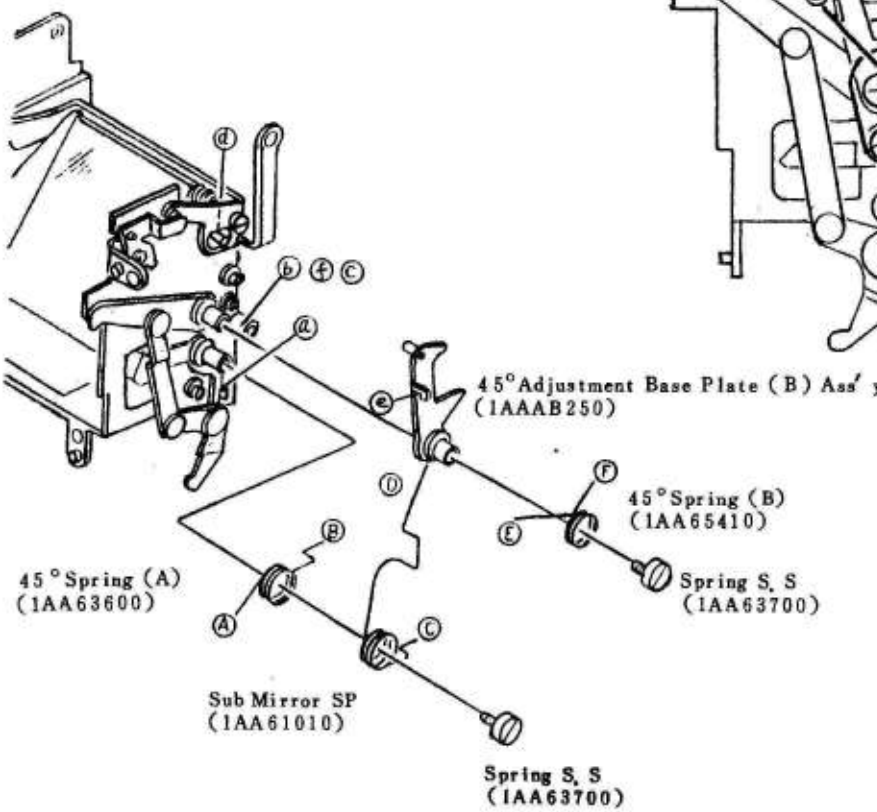
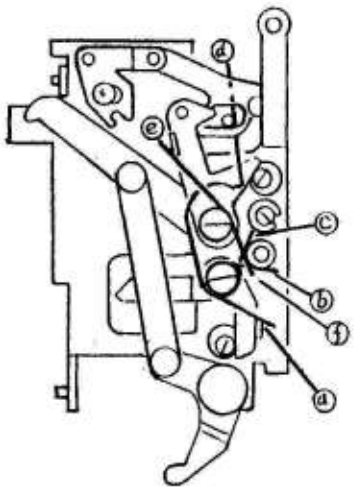


Fig. 143



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C-1-17 Installation of Mirror Box Base Plate

1. Lift up the Aperture Lever (L) of the Mirror Box Base Plate in the direction indicated by the arrow Ⓐ.
2. Turn the Aperture Ring of the Mount Base Ass' y in the direction indicated by the arrow Ⓑ. While holding the Aperture Ring in the position, install the Mirror Box Base Plate Ass' y. Secure it with the Mirror Box Base Plate Setscrews (61923026)×3, (61922026)×2.
3. Install the FPC Protection Plate (1AA65900), insert the Washer (60122112) and secure it with the FPC Proteciton Plate setscrews (61923026 and 61912026).

Notes:

a) Pay attention to the Light-Proof Curtain when installing the Mirror Box Base Plate Ass' y.

b) Make sure that the Mirror Box Base Plate Ass' y is firmly fixed on the Mount Base Ass' y without any loosening.

c) Make sure that the Aperture Ring is in the position indicated in Fig.145①. If it is in the position indicated by Fig. 146,① follow the above procedure from the beginning.

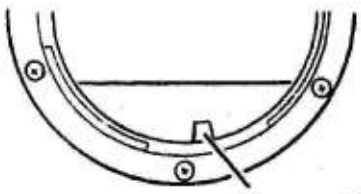


Fig. 145 ①

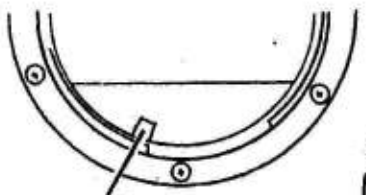
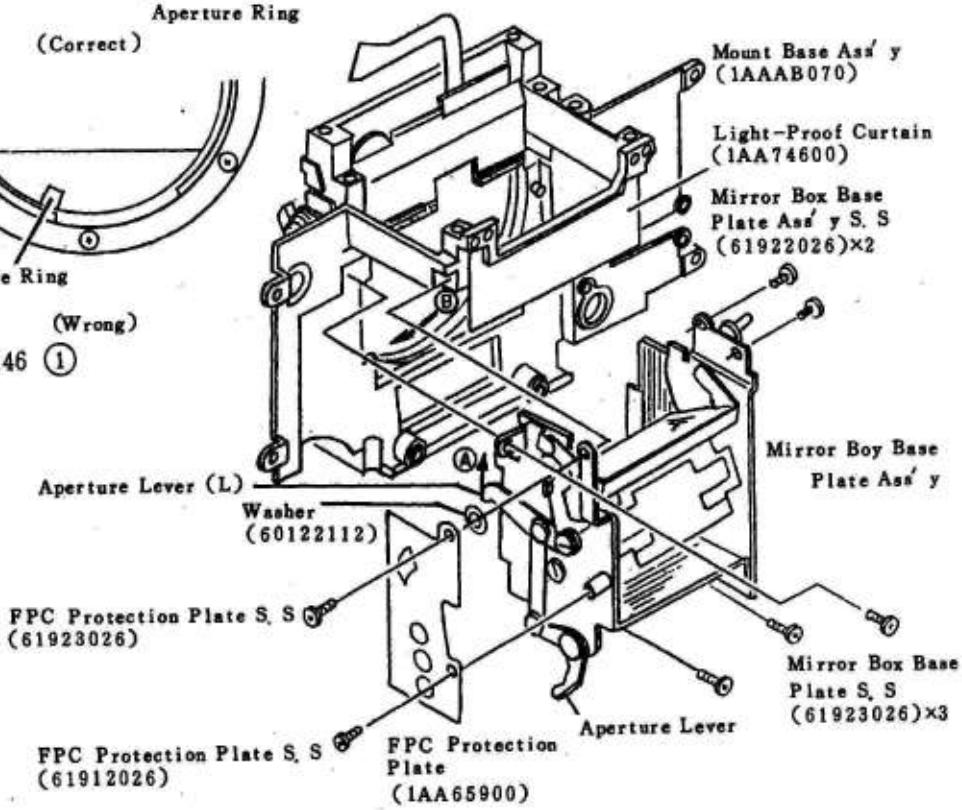


Fig. 146 ①

Fig. 144



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〔Timing adjustment of Mirror Up switching〕

Move the Mirror Up Arm Ass' y in the direction indicated by the arrow to set it in the "up" position. Loosen the Mirror Up Switch Setscrew to adjust the Mirror Up Switch so that the distance between the mirror reflection plane nd the Mirror Cushion is 1.0 to 0mm.

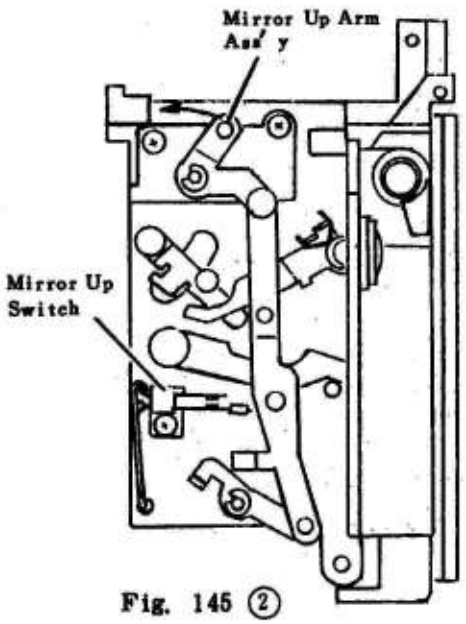
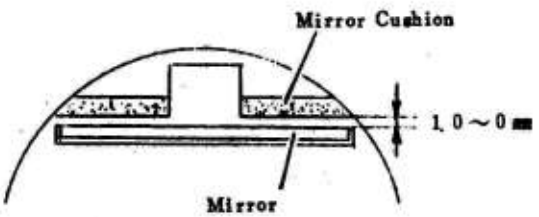


Fig. 145 ②

Fig. 146 ②



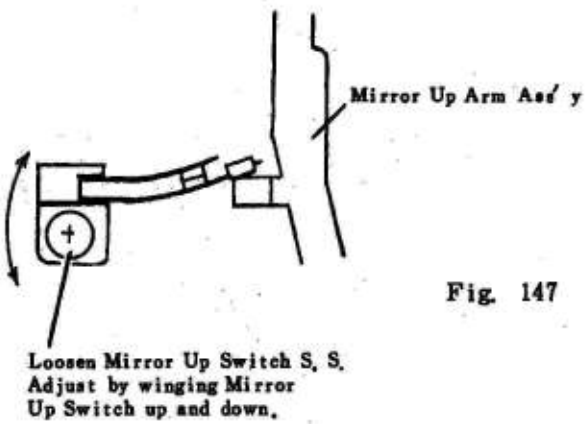


Fig. 147

〔1 Confirmation of timing of Mirror Up Switch〕

* After installing the Mirror Box Ass' y to the camera body and mount the QR Lever Ass' y, check the timing of the Mirror Up switching on.

1. Make sure that the Mirror Up Switch is ON with the Mirror in the "up" position when the Shutter Charge Cam Ass' y is turned clockwise.

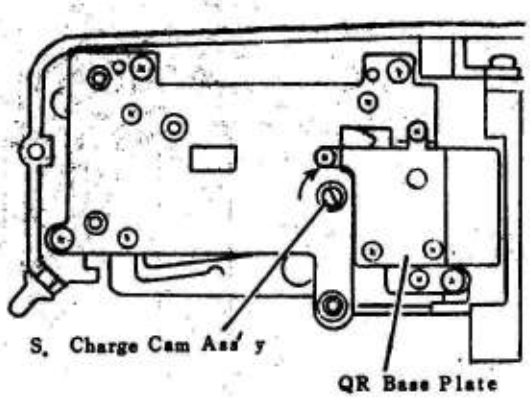


Fig. 148

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〔2 Reconfirmation of timing of Mirror Up Switch〕

* After installing each parts(not necessarily for exterior parts) and soldering each lead wire, reconfirm the timing of the Mirror Up Switch.

1. Set the voltage regulator to 4.2V.
2. Connect the terminals of (+) and (−) to the camera body.
3. Release the shutter.
4. Check if the Mirror stays in the "up" position. If it falls down without staying in the "up" position, the timing of the Mirror Up Switch is early. Readiust the Mirror Up Switch.

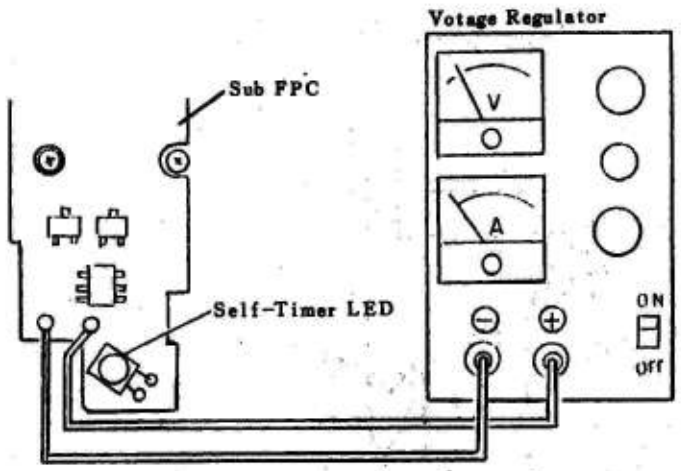

Fig. 149

〔Adjustment of Mirror Box Ass'y〕 (See Fig. 150)

- The screw Ⓐ is for horizontal adjustment of the Mirror. Never loosen the screw Ⓐ otherwise the Mirror will be out of the horizontal.

- The screw Ⓑ is for vertical adjustment of the Mirror (for the fine adjustment of the Viewfinder focusing)
  When a rough adjustment for the Viewfinder focusing is necessary (i.e. adjustment of 0.1㎜ or greater in the movement of lens 50/F1.4), it must be done by choosing and replacing the Washer located under the Penta Prism Holder. Since the vertical adjustment of the Mirror for adjustment of Viewfinder focusing may cause a parallax, pay attention to it.
  When the Viewfinder focusing is adjusted by the screw Ⓑ, make sure to check also the Spot Metering position and parallax.

- The screw Ⓒ is for Sub Mirror position adjustment (Spot Metering position adjustment)
  When an equipment for the spot Metering position adjustment is not available, do not use the screw Ⓒ otherwise the correct Spot Metering position will deviate.

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o The screw Ⓓ is for Mirror 45° position adjustment.
Never use the screw Ⓓ where the special tools for the Mirror 45° position adjustment is not available for the Ⓓ sets standard in Spot Metering position, parallax and Viewfinder focusing.

Notes:

a) After the Mirror Box Ass' y is removed, check to adjust the follwing:

① Flange back adjustment

② Viewfinder focusing adjustment

③ Parallax adjustment

(Refer to C-47 for adjustment procedures)

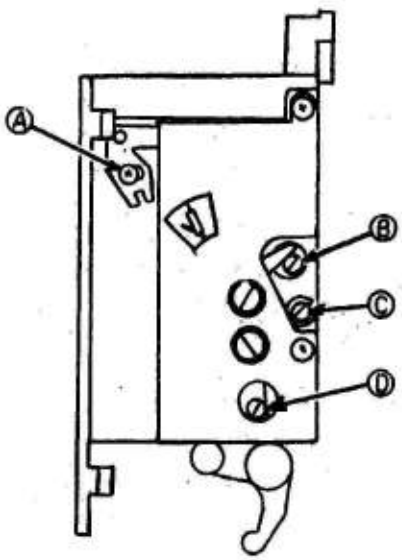

Fig. 150

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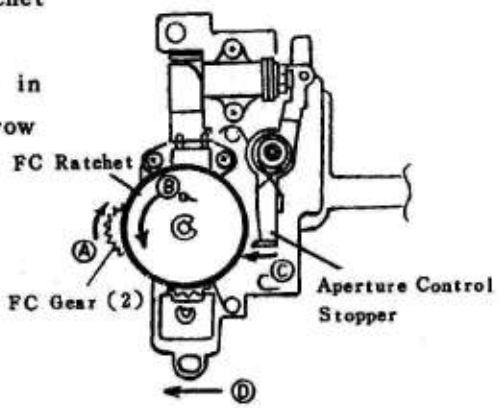
C-1-18 Installation of Aperture Control Ass' y

1. Turn the FC Gear (2) in the direction indicated by the arrow Ⓐ and disengage the FC Gear (2) when the FC Ratchet has made about one revolution. Make sure that the FC Ratchet turns smoothly (check it four or five times).
2. Turn the FC Ratchet for about 90° (1/4 rotation) in the direction indicated by the arrow Ⓑ from the position that the Ratchet returned and stopped. Move the Aperture Control Stopper in the direciton indicated by the arrow Ⓒ and lock the FC Ratchet.
3. With the Ratchet being locked, install it to the Mirror Box Ass' y and tighten lightly the Aperture Control Ass' y Setscrew on the top (61912526). Slide the Aperture Control Ass' y in the direction indicated by the arrow Ⓓ and engage it firmly with the FC Gear (1) and the Aperture Ring Gear.
4. Tighten lightly the Aperture Control Ass' y Setscrews (61912526)×2 beneath.
5. Unlock the Aperture Control Stopper.
6. Rotate the Aperture Ring to check if the FC Ratchet and the Aperture Ring turn smoothly.
7. When they do not turn with ease due to the fact that they are engaged too deeply, loosen the two aperture Control Ass' y Setscrews beneath and adjust the gear connection between the FC Gear (1) and the Aperture Ring Gear (engagement: about 2/4).
8. After checking the gear engagement, tighten firmly the Aperture Control Ass' y Setscrews.

Fig. 151



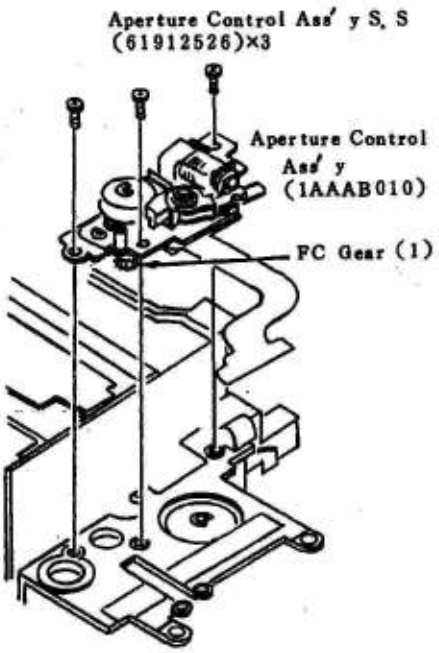


Fig. 152

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C-1-19 Forming of DX FPC

* Before installing the DX FPC, bend it as illustrated below.

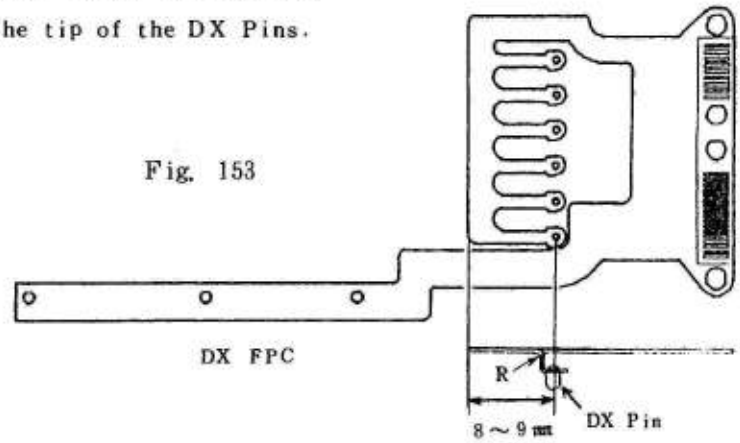
1. Bend the DX FPC so th t the center of the DX Pin is positioned 8 to 9 mm from the DX FPC corner.

Notes:

a) Leave the radius in the bent portion.

b) Do not soil the tip of the DX Pins.

Fig. 153

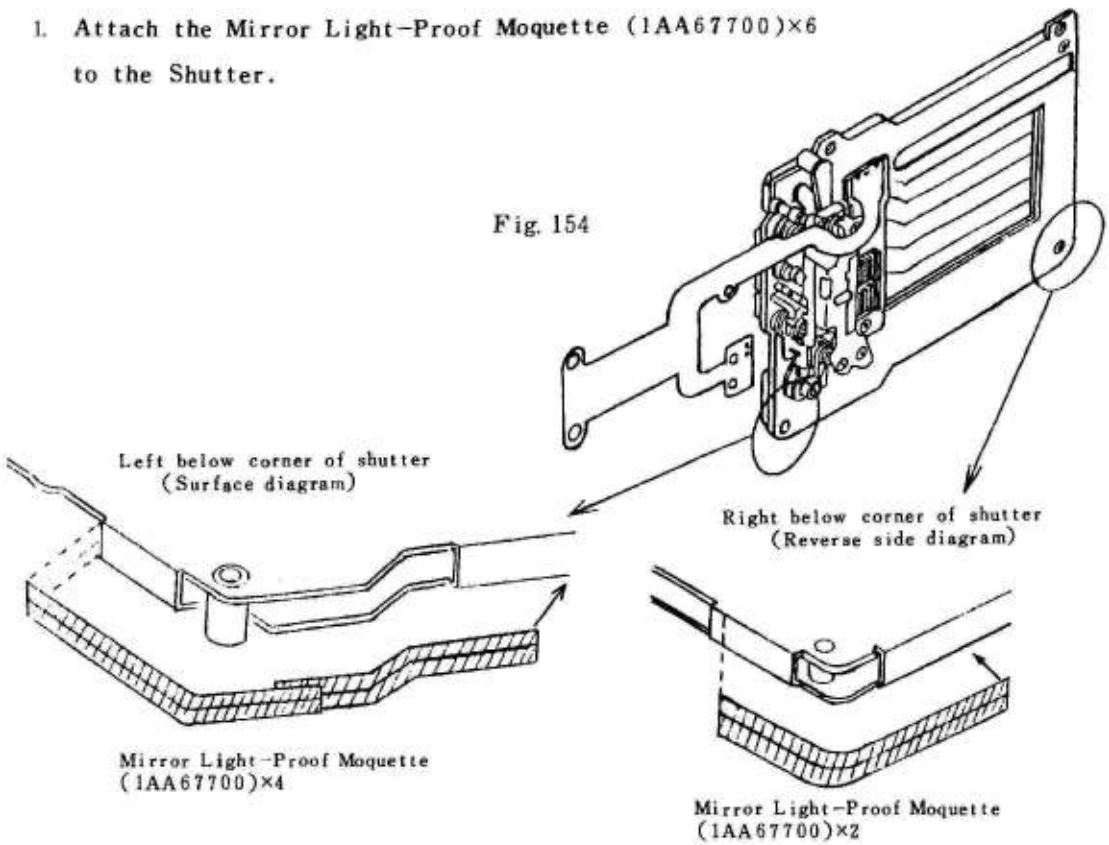


C-1-20 Attaching Shutter Light-proof Moquette

* After replacing the Shutter, attach the Moquette in both lower corners of the Shutter.

1. Attach the Mirror Light-Proof Moquette (1AA67700)×6 to the Shutter.

Fig. 154



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C-2 Assembly and Adjustment of Parts in Camera Body

C-2-1 Sticking of Body Seal

1. Apply Loctite prism primer and then Loctite 402 on portion Ⓐ of the camera body, and stick the end of the Body Seal (1) (1AA13500).

Note : a) Be sure to stick the seal in correct position. Loctite 401 is a powerful adhesive, so that you can not retry the sticking.

2. Apply Loctite prism primer and then Loctite 401 all along the grooves in the camera-body.
   Stick the Body Seal (1) from the end stuck previously.
3. Stick the Body Seal (2) (1AA13600) to portion Ⓑ of the camera body, following the same procedure as 1 and 2 above.

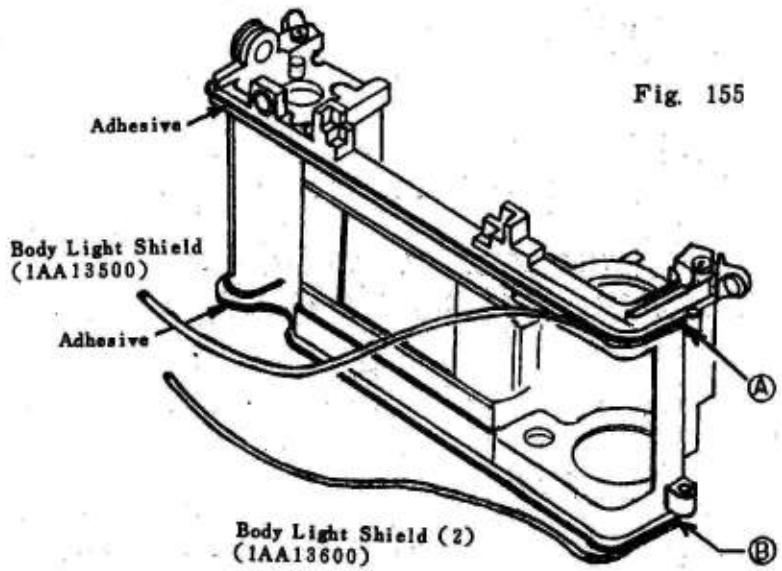

Fig. 155

Notes:

a) Do not allow the adhesive to spill out of the grooves of the camera body.

b) The gas from the adhesive can whiten the surrounding area of the camera body. Therefore, use 24 hours of open time after the seal sticking.

c) If Loctite prism primer and Loctite 401 are not available, use an crazy glue or Super glue. In this case, drip the crazy glue or super glue a few drops at a time and proceed with the sticking quickly. Use 24 hours of open time after the seal sticking.

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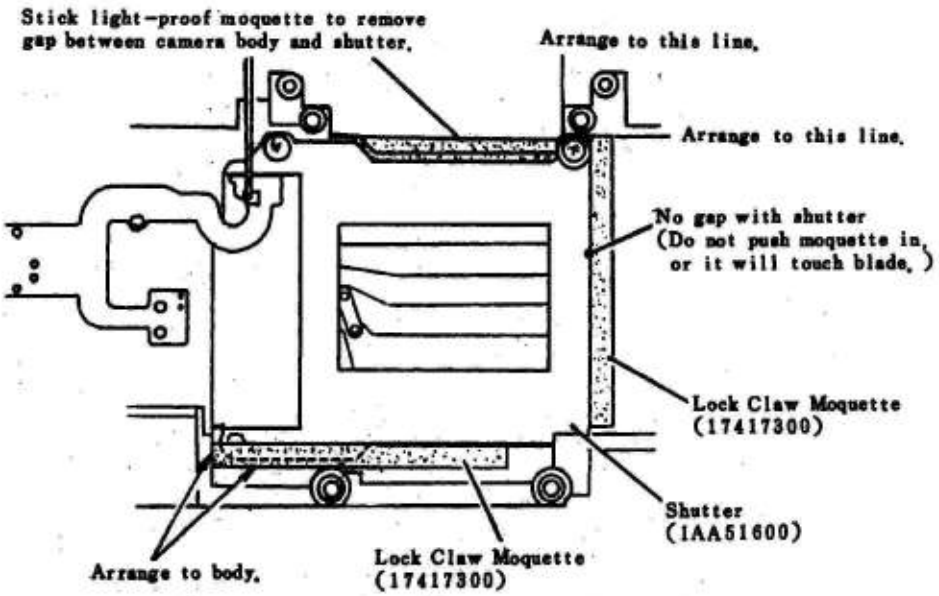
C-2-2 Sticking of Shutter Light-proof Moquette

* The light-proof moquette must be stuch on the camera body after installing the shutter.

1. Stick the Light-proof Moquette (1AA69800) on the upper part of the shutter and the camera body.
2. Stick aLock Claw Moquette (17417300) on the right side of the shutter.
3. Stick a Lock Claw Moquette (17417300) on the lower side of the shutter.

Fig. 156


Stick light-proof moquette to remove gap between camera body and shutter.
Arrange to this line.
Arrange to this line.
No gap with shutter (Do not push moquette in, or it will touch blade.)
Lock Claw Moquette (17417300)
Shutter (1AA51600)
Arrange to body.
Lock Claw Moquette (17417300)

C-2-3 Hooking Up of Mech. Bulb Spring

1. Hook up the Mech. Bulb Spring (1AA98900) in the order of ① and ② :
   ① Hook up the Mech. Bulb Spring to the Mech. Bulb Lever Ass' y (1AAAA210).
   ② Hook up the Mech. Bulb Spring to the camera body.
2. When the Mech. Bulb Lever Ass' y is moved in the direction of the arrow, the Mech. Bulb Lever Ass' y must return by the force of the Mech. Bulb Spring.

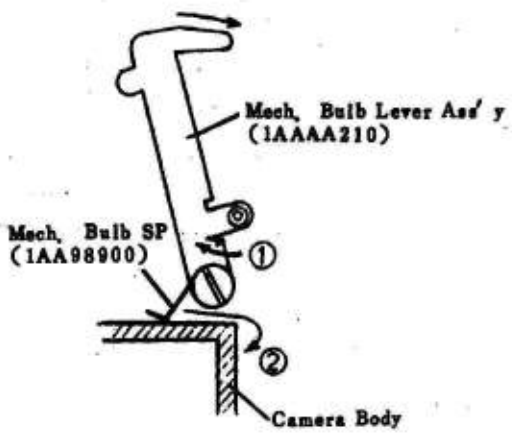


Fig. 157

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〔Adjustment of Mech. Bulb Switch〕

* After installing the Mech. Bulb Lever Ass' y on the camera body, the timing of mech. Bulb switch ON must be adjusted.

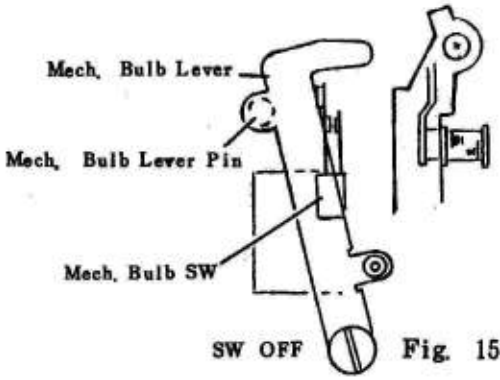

Fig. 158

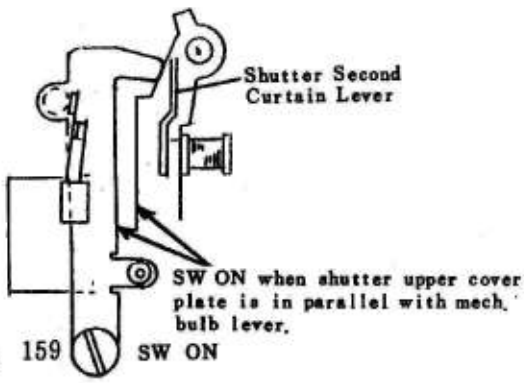

Fig. 159

The switch must be OFF in the initial state. The switch must be ON when the Mech. Bulb Lever is in parallel with the Shutter Upper Cover Plate. Ths switch must be surely ON when it has come in contact with the Shutter Second Curtain Lever. (Fig. 159)

C-2-3 Installation of S. Charge Base Plate Ass' y

1. Set the Spool Holder (1AA14310).
2. Pass the lead wires of the Shutter Charge Motor down below the camera body, and install the S. Charge Base Plate Ass' y.
   At this time, push the S. Charge Lever in the direction of the arrow, and set the S. Charge Base Plate Ass' y.
3. Tighten it up with S. Charge Base Plate Unit Setscrews (61923026)×3.

Note : a) When installing the S. Charge Base Plate Ass' y withe the Spool and winging Unit Ass' y assembled, be sure to pass the lead wires through the holes of the Spool and Winding Unit Ass' y. (See Fig. 161)

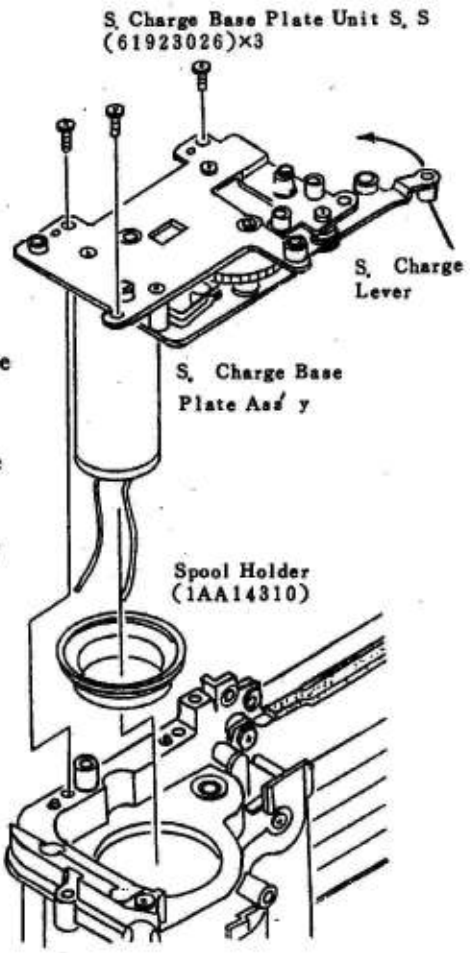

Fig. 160 ①

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C-2-4 Installation of Winding Unit Ass' y

1. Set the Spool spring (1AA36310) in the Spool (1AA36200).
2. Pass the lead wires (red and black) of the Shutter charge Motor through the Spool, and set the Spool in the camera body.

Note : a) When setting the Spool with the Film Holding Unit installed, install the Spool in the body by moving the Film Holding Roller in the direction of the arrow.

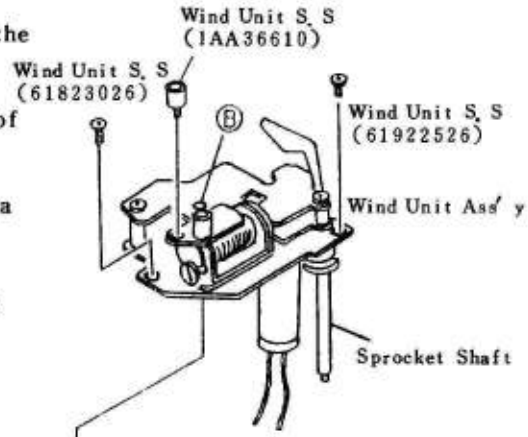
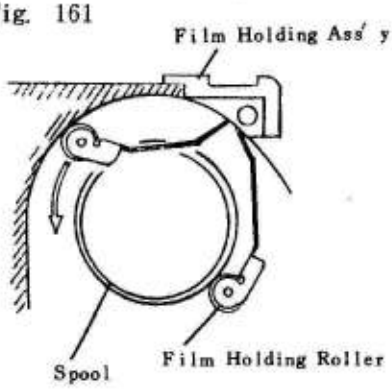
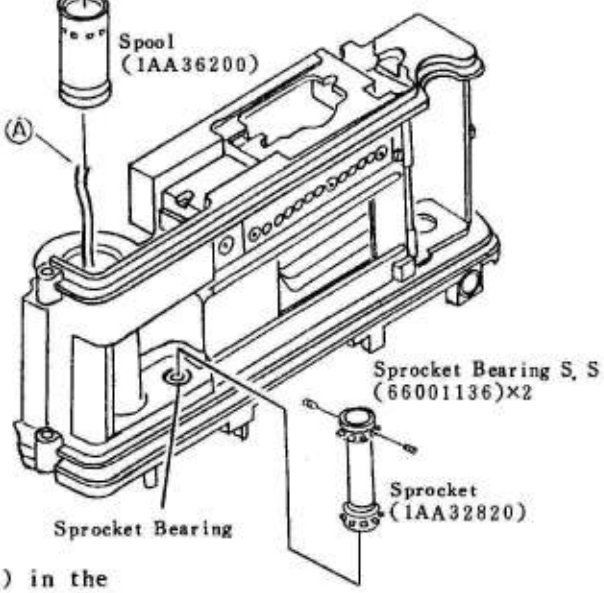


Fig. 160 ②

Fig. 161





3. Fit the Sprocket Bearing (1AA32910) in the Sprocket (1AA32820), and fix it by tightening the Sprocket Bearing Setscrews (66001136)×2.

Note : a) Introduce the Sprocket Bearing, the thicker side below, in the Sproeket.

4. Install the Sprocket in the camera body, with the bearing side below.

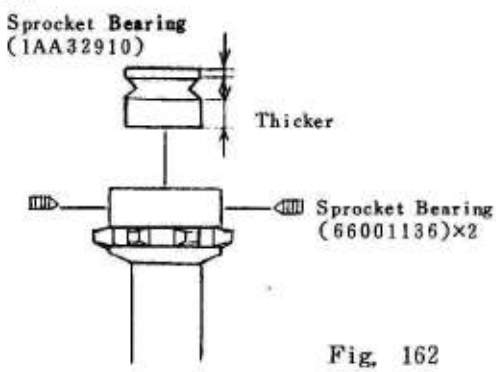


Fig. 162

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5. Pass the lead wires (redand black) Ⓐ of the Shutter Charge Motor through hole Ⓑ of the Winding Unit Ass' y, and install the Winding Unit Ass' y in such a way that the Sprocket Shaft enters the Sprocket. (See Fig. 160) At this time, fit the end of the Spool Spring in the groove of the Winding Gear (10) and install the Winding Unit Ass' y. (See Fig. 163)
6. Tighten the Winding Unit Setscrews (61823026), (61922526), (1AA36600).

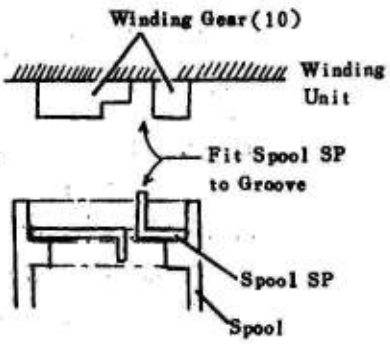


Fig. 163

Note : a) Tighten the Setscrews only after making sure that the end of the Sprocket Shaft is properly inside the Sprocket Shaft Bearing.

〔Application of Acetate Cloth Tape〕

There are cases where a short results between the enamel wire of the Solenoid Plunger and the Winding Unit Base Plate. To prevent this short, apply acetate cloth tape in the position indicated in the illustration below.
It is not necessary to use acetate cloth tape, however, when the form of Sub FPC is modified.

Fig. 164

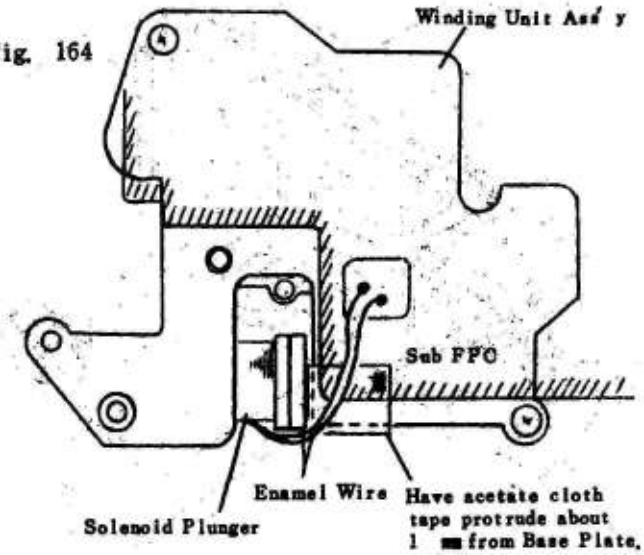
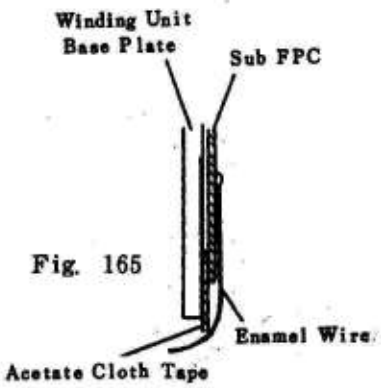


Fig. 165



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C-2-5 Installation of Mirror Box Ass' y

1. Pass the Spot Metering FPC Ⓐ of the Mirror Box and the yellow and black lead wires Ⓑ of the Mirror-up Switch through the camera body, and install the Mirror Box Ass' y in parallel with the camera body.

Notes:

a) Have the red and black lead wires Ⓒ of the winding motor led out to the left side.

b) Hove the light blue and black lead wires Ⓓ of the Shutter led out to the left side.

c) Do not allow the FPC and lead wires to be pinched between the Mirror Box and the camera body.

2. Tighten the Mirror Box Setscrews (66001061)×2 provisionally, having the camera body face up and holding the film surface of the camera body with the left hand.

Note : a) Never tighten the Mirror Box Setscrews with film surface of the camera body down. (See Page. B-23)

3. Tighten the Mirror Box Setscrews (63927026)×2 with the body mount surface of the camera body.
4. Tighten the Mirror Box Setscrew (61924026) with erecting the camera body.
5. Install the Eye-Piece Ass' y, secure it with one Setscrew, and them tighten up the Mirror Box Setscrews (66001061)×2.

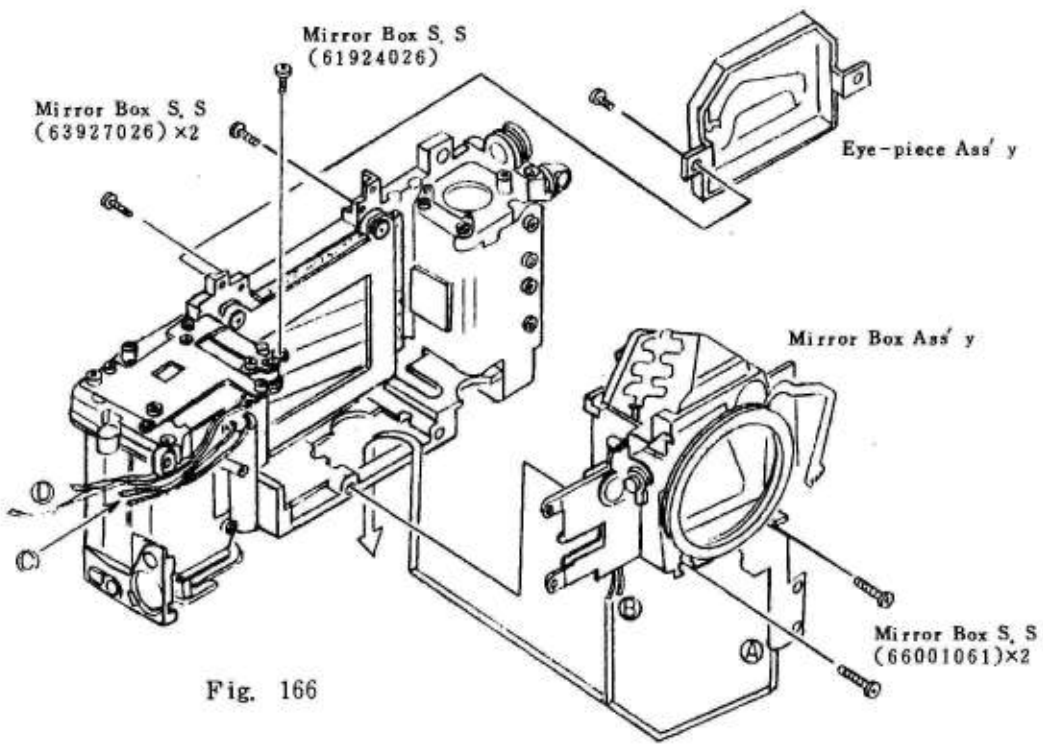

Fig. 166

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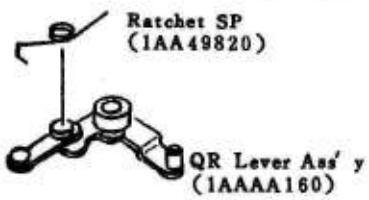
C-2-6 Installation of QR Lever Ass' y

Fig. 167



1. Attach the Ratchet Spring (1AA49820) to the QR Lever Ass' y (1AAAA160) and hook up the Ratchet Spring.
2. Turn the S. Charge Cam clockwise (mirror charge direction) (arrow ①) until it stops, then turn it counter-clockwise (shutter charge direciton) (arrow ②) until it stops. This is the initial position of the S. Charge Cam Ass' y.
3. Move the pin of the Mirror-up Arm Ass' y in the direction of the arrow ③ and install the QR Lever Ass' y in that state.
4. Set the QR Base Plate (1AA48010) and fix it by tightening the QR Base Plate Setscrews (61912026)×2, (63903026)×2. (See Fig. 34)

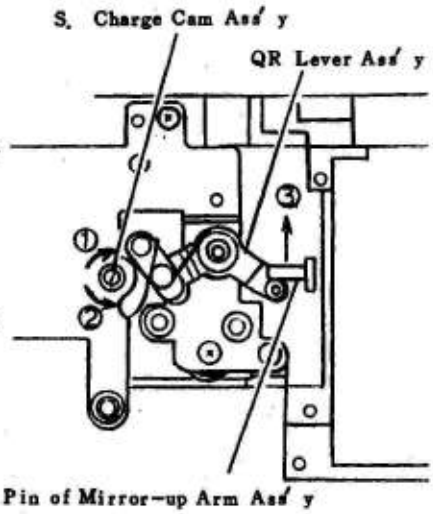


Fig 168

C-2-7 Checking of Mech. Bulb Operation

* The operation of the Mech. Bulb must be checked after installing the Mech. Bulb Ass' y.

[Checking Procedure]

1. Install the Mech. Bulb Ass' y. (See Page. B-15)
2. Push the Mech. Bulb Slide Plate to the right (Body mount side). (See Fig. 169)
3. With the Mech. Bulb Slide Plate pushed to the right, turn the S. Charge Cam clockwise (see C-2-6) for mirror-up.
4. Make certain at this time that the shutter is open.
5. Also make certain that the shutter closes when the Mech. Bulb Slide Plate is released.

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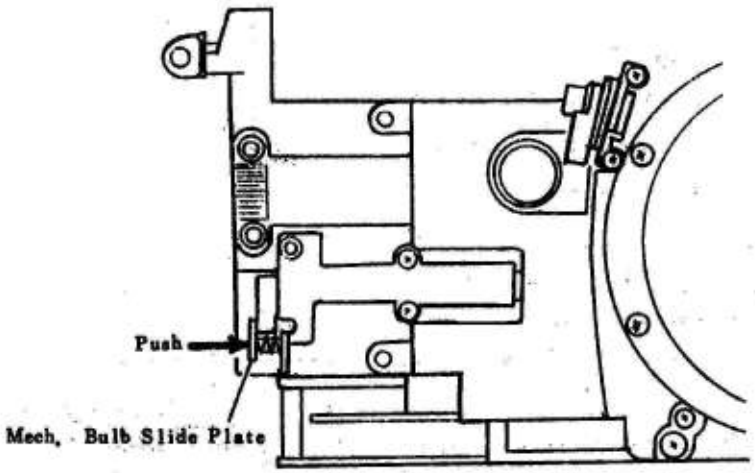


Fig. 169

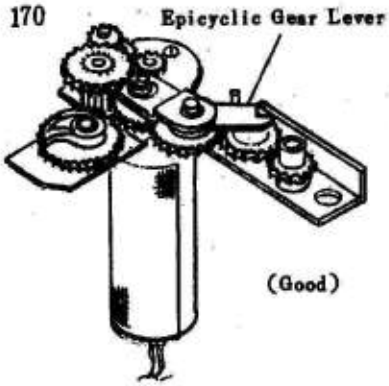
C-2-8 Installation of Rewing Base Plate Ass' y

1. Twist the red and black lead wires of the Rewind Motor, pass them through the hole in the camera body, and install the Rewind Base Plate Ass' y.

Notes:

a) When installing the Rewing Base Plate Ass' y, the Epicyclic Gear Lever Ass' y must be in the position shown in Fig. 170. Do not install it with the Epicyclic Gear Lever Ass' y set as shown in Fig. 171 or Fig. 172. Otherwise, the Epicyclic Gear Lever Ass' y will get bent, hitting the surface Ⓐ of the camera body. (See Fig. 174)

Fig. 170



(Good)

Fig. 171

(Not acceptable)

Fig. 172

(Not acceptable)

b) Position the pink and light blue lead wires of the Came P.C. Board above the Rewind Base Plate before installing the Rewing Base Plate Ass' y. (See Fig. 174)

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2. Lead the red and black lead wires of the Rewind Motor between the Mount Base and FPC.

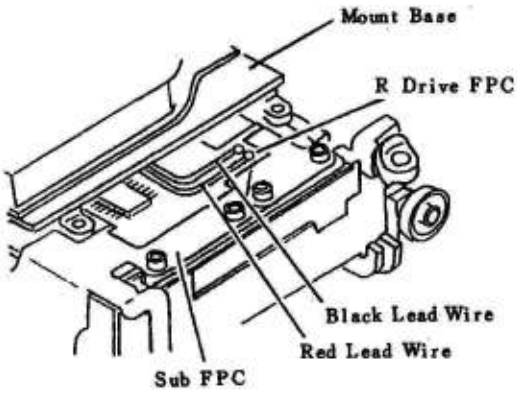


Fig. 173

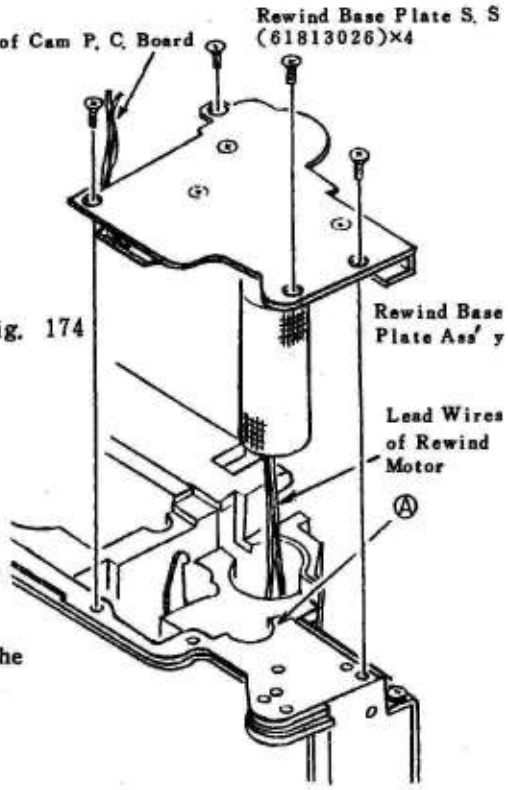


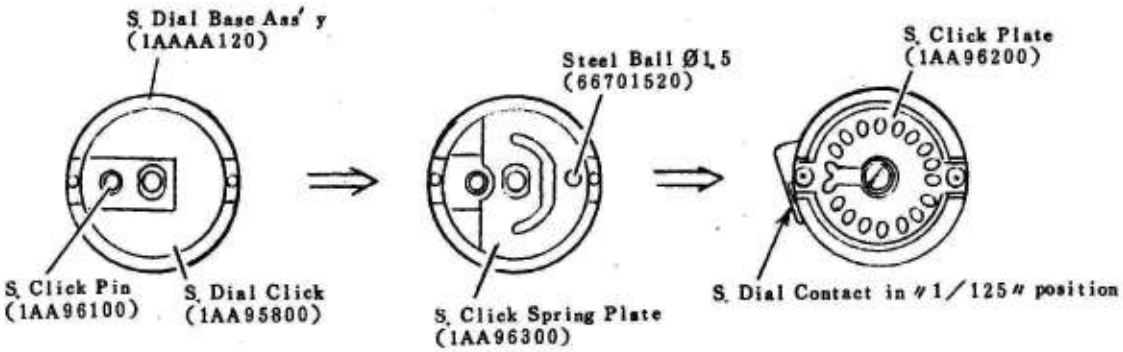
Fig. 174

3. Tighten the Rewind Base Plate Setscrews (61813026)×4.
4. Solder the red and black lead wires of the Rewind Motor.

C-2-9 Installation of S. Dial Click

1. Install the S. Dial Base Ass' y (1AAAA120).
2. Install the S. Dial Click (1AA95800) in the S. Dial Base Ass' y Set the S. Click Spring (1AA95900) and S. Click Pin (1AA96100) in the hole in the S. Dial Click.
3. Install the S. Click Spring Plate (1AA96300). Set the Steel Ball (66701520) in the hole in the S. Click Spring Plate and tighten the S. Dial Click Setscrew (1AA96000).
4. Install the S. Click Plate (1AA96200) and tighten the S. Click Plate Setscrews (61902526)×2. (See Fig. 10)

Fig. 175



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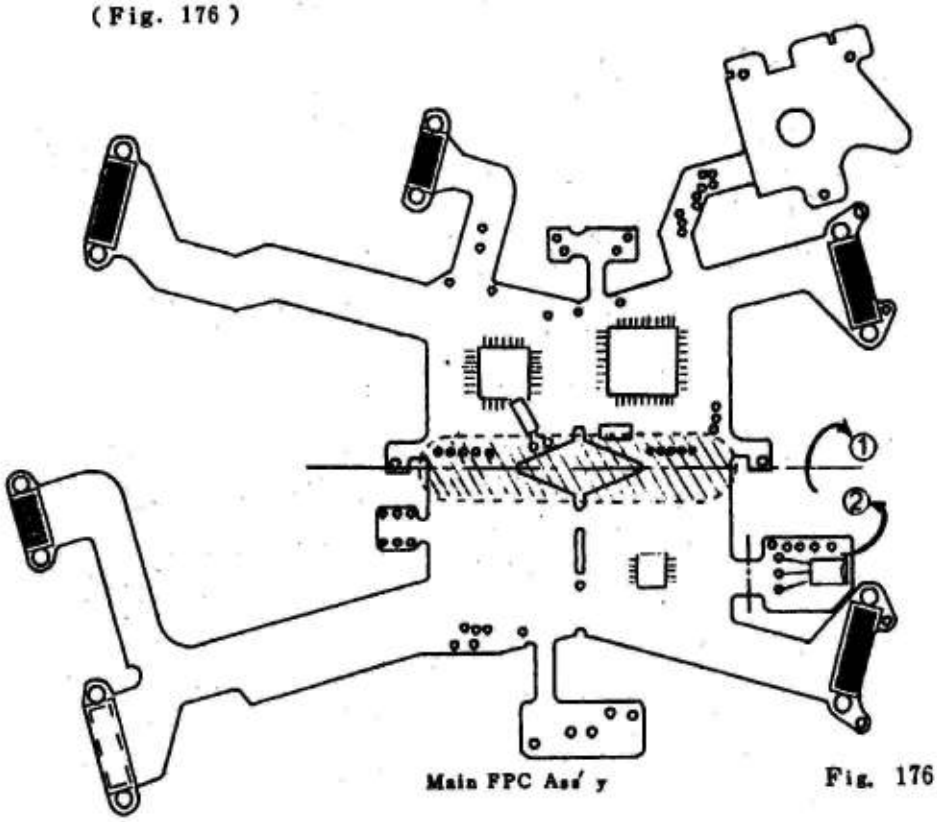
C-2-10 Forming of FPC

1. Forming of Main FPC Ass' y

   Before installing a new Main FPC Ass' y, be sure to perform bending in the direction of the arrows in the order of ① to ②. (Fig. 176)



Main FPC Ass' y Fig. 176

Note : a) In bending instructed above, take care not to brake the ▨ area of the FPC by excessive bending.

2. Forming of Sub FPC Ass' y

   Before installing a new Sub FPC Ass' y, be sure to perform bending in the direction of the arrows in the order of ① to ② and ③ to ④. (Fig. 177)

   Also bend the Sub FPC Ass' y gently in the direction of arrows Ⓐ to Ⓑ by 90 degrees.

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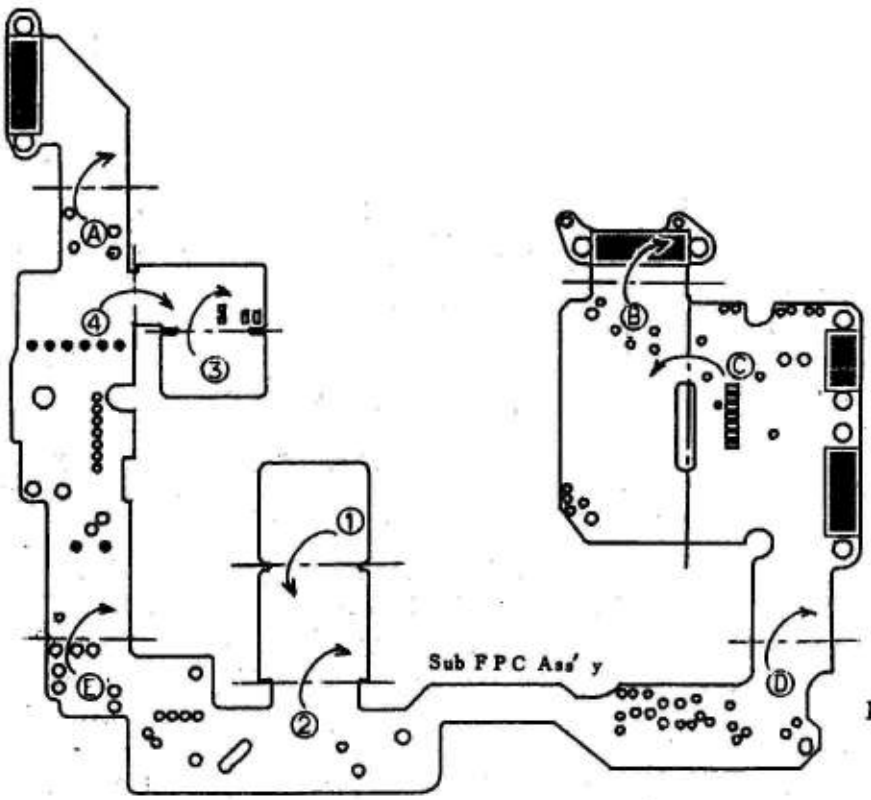

Fig. 177

C-2-11 Installation of Filter P. C. Board

1. Install the Filter S. C. Board as shown in Fig. 178.

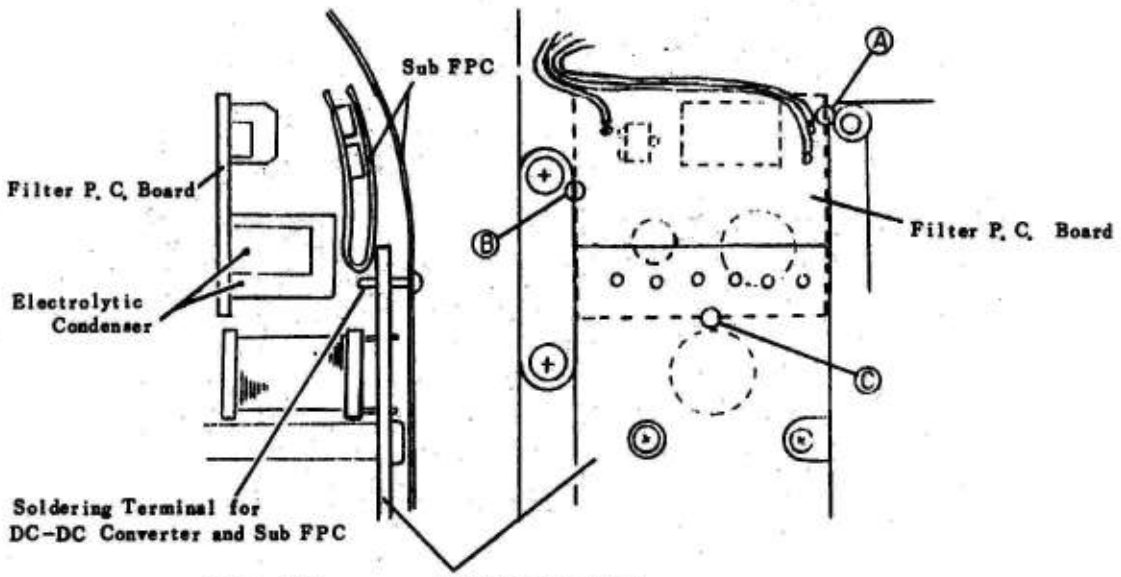

Fig. 178

Fig. 179

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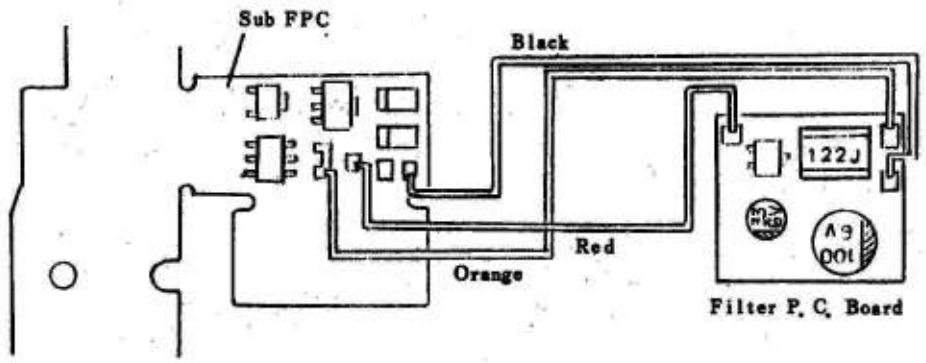
Notes:

a) Lock the Filter P.C. Board at the three points Ⓐ, Ⓑ and Ⓒ. (See Fig. 179)

b) The soldering terminal for the DC-DC Converter and Sub FPC must not be in contact. If it is in contact, the power transistor will be burned out at power-on.

[Wiring Diagram of Filter P.C. Board]

Fig. 180



C-2-12 Notes on Soldering (Bottom of Camera Body)

a) In soldering the lead wires at the bottom of the camera body, minimize the solder height. As there is little clearnace between the camera body and the cell case, a high solder is pressed by the cell case and can cause shorting.

b) After soldering the lead wires, fix acetate cloth tape.

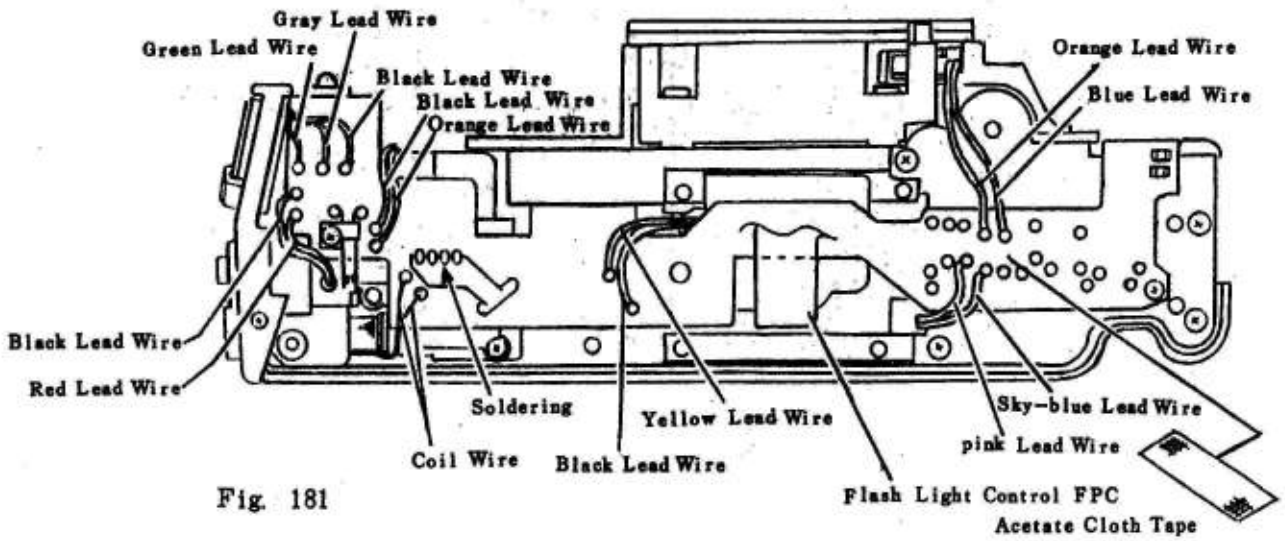


Fig. 181

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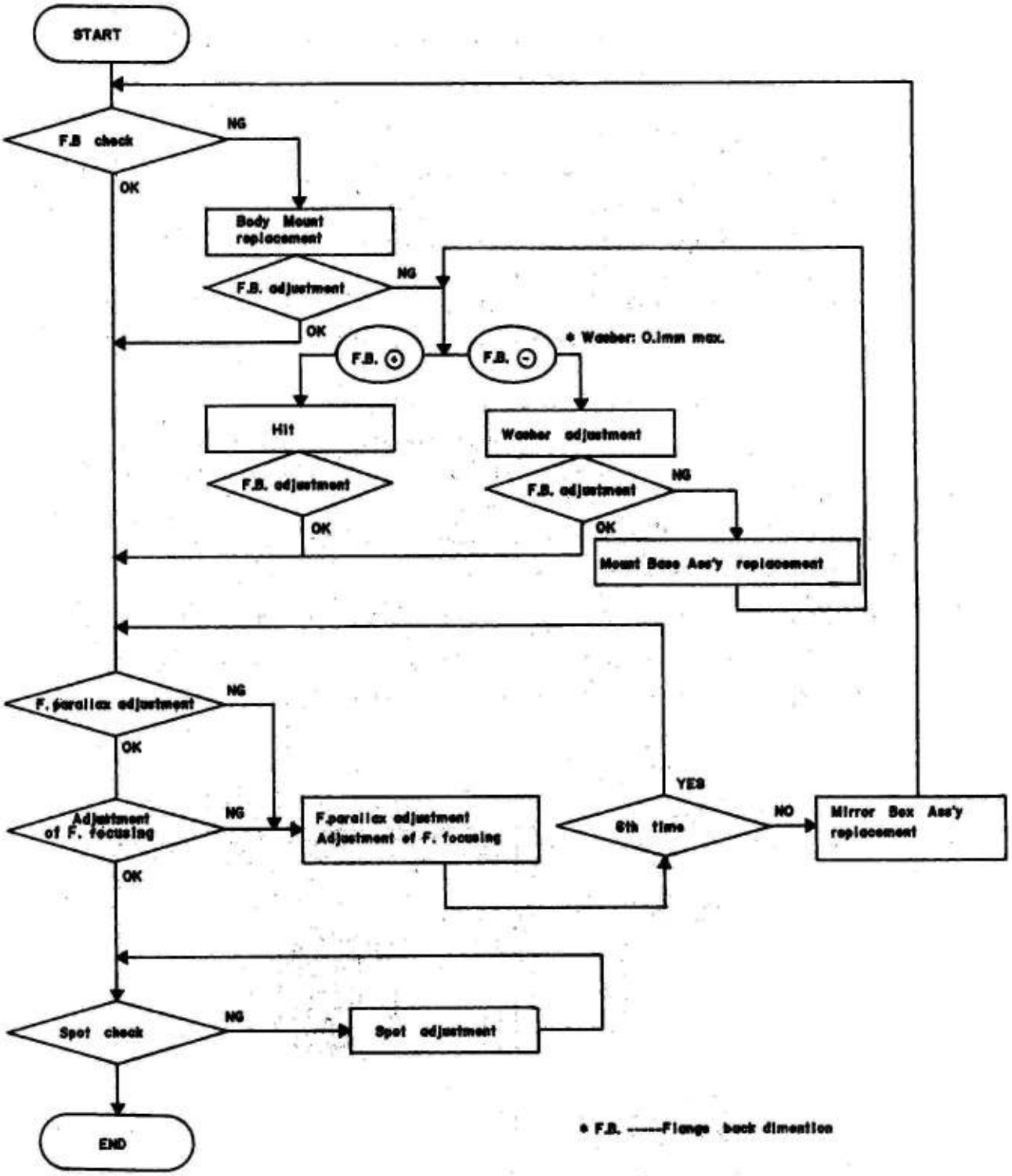
C-3 Adjustments, etc.

C-3-1 Adjustment of Finder Focusing



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1. Flange Back Adjustment

o Distance from the lens mount surface to the rail surface on the pressure plate side:

45.60±0.02mm

o Difference in level between the rail surface on the pressure plate side and that on the film side:

0.2±0.02mm

2. Finder Parallax Check

① Affix an F. parallax check chart (Chart A) on a wall.

② Mount a lens (Planar 50/F1.4) to the camer.

③ Affix a frosted sheet glass on the film slide surface of the camera.

④ Mount the camera on the tripod.

⑤ Set the tripod so that the optical axis of the camera is perpensicular to the chart and the distance from the chart to the frosted glass is one meter.

⑥ Adjust the focus of the lens and perform mirror-up.

⑦ While looking at the image on the frosted glass, adjust the optical axis of the camera to the center of the chart and simultaneously adjust the position in the horizontal direction.

⑧ With the mirror down, look at the image in the finder and make sure that the image is not deflected from that on the frosted glass.

〔When deflection is large (out of specification limit)〕

Adjust the position of the Penta Prism Holder Ass' y so that the image in the finder coincides with that on the frosted glass.

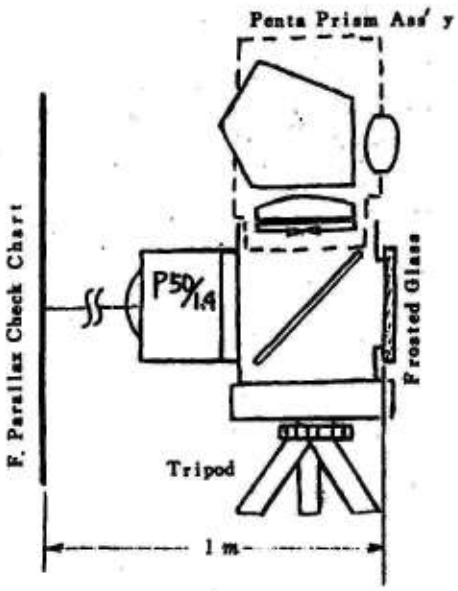

Fig. 182

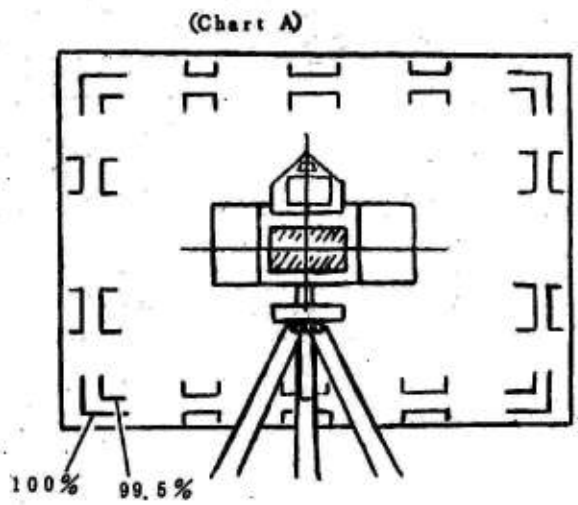

Fig. 183

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3. Adjustment of Finder Focusing

1. Rough adjustment of finder focusing

Replace the washer placed under the Penta Prism Holder to make adjustment. (See Fig. 49.)

① When the focus is not adjusted when the focus ring on the lens is turned to the infinity position

→ The finder back is too long. Lower the focusing screen to shorten the finder back.

② When the focus is adjusted before the focus ring on the lens is turned to the infinity position

→ The finder back is too short. Raise the focusing screen to lengthen the finder back.

2. Fone adjustment of finder focusing

o Adjust the vertical position adjusting screw for the mirror only when 0.1㎜ or less moving of the standard lens Planer 1.4／50 is required.

A. When the Main FPC Ass' y has not been installed

① Install a mechanical cable release in the Bulb-dedicated Cable Release Socket.

② Look the mechanical cable release by pressing.

③ Turn the S. Charge Cam Ass' y clockwise, and mirror-up performed and the shutter will be opened. (See Fig. 148)

④ From the aperture side, turn the vertical position adjusting screw for the mirror.

⑤ Unlock the mechanical cable release, and the shutter will be closed.

⑥ Turn the S. Charge Cam Ass' y counterclockwise, and the mirror will return.

⑦ Check finder focusing again.

⑧ If finder focusing is not proper, follow the procedure ② to ⑦ again.

⑨ Check finder parallax.

⑩ Adjust the spot metering position.

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B. When the Main FPC Ass' y has been installed and operates normally

① Install a mechanicalcable release in the Bulb–dedicated Cable Release Socket.

② Turn on the main switch and lock the mechanical cable release by pressing.

③ Press the release button on the camera, and the shutter will be opened.

④ From the aperture side, turn the vertical position adjusting screw for the mirror. (See Fig. 184)

⑤ Unlock the mechanical cable release, and the shutter will be closed.

⑥ Check finder focusing again.

⑦ It finder focusing is not proper, follow the procedure ① to ⑥ again.

⑧ Check finder parallax.

⑨ Adjust the spot metering position.

Notes:

a) After adjustment of finder focusing, be sure to check finder parallax and the spot metering position.

b) After adjustment of finder focusing, operate the shutter several times and then check finder focussing again.

c) Turn the vertical position adjusting screw for the mirror with care not to peel the coating.

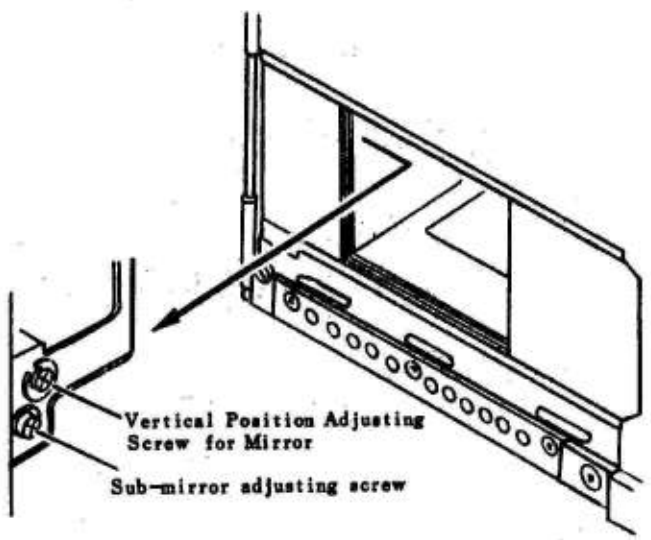

Fig. 184

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4. Check of Spot Metering

① Affix a spot check chart (Chart C) on the parallax check chart on the wall. (Position the chart correctly.)

② Mount a lens (Planar 50/F1.4) on the camera.

③ Mount the camera on the tripod.

④ Set the tripod so that the optical axis of the camera is perpendicular to the chart and the distance from the chart to the film surface is one meter.

⑤ Adjust the focus of the lens and then adjust the optical axis of the camera to the center of the chart.

⑥ With the power switch of the camera turned on, perform half releasing in spot and AE mode and look at the shutter speed display in the viewfinder.

⑦ Swing the camera vertically and horizontally and make sure that the shutter speed is highest When the white circle on the chart is at the center of the viewfinder. (Non-defective camera)

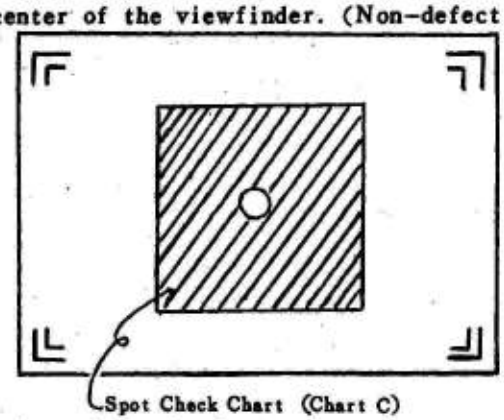

Fig. 185

5. Adjustment of spot metering

* After adjustments [A] and [B], perform final check using the Chart C.

[A] Adjustment in lateral direction

① Affix a spot check chart (Chart B) in the standing position on the F. parallax chart on the wall. (Position the chart correctly.)

② Mount a lens (Planar 50/F1.4) on the camera.

③ Remove the Tripod Screw Base Ass' y from the camera and install a tripod fixture instead.

④ Lock the tripod fixture on the tripod so that the camera is installed upside down.

⑤ Adjust the focus of the lens and then adjust the optical axis of the camera to the center of the chart.

⑥ Loosen the four Spot Metering Base Setscrews, turn the Spot Metering Adjustment Pin, perform half release in spot and AE mode and lock the Spot Metering Base where the shutter speed is highest. (Tighten the four screws and lock them with Screw-Lock. (See Fig. 187)

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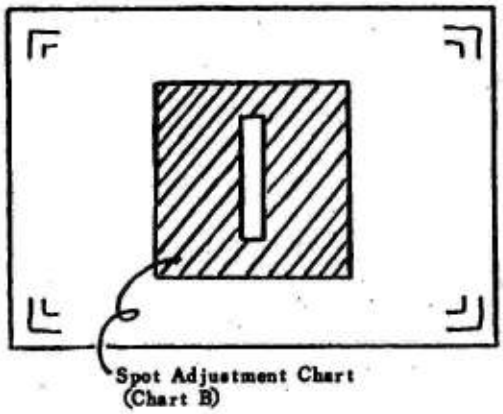

Fig. 186

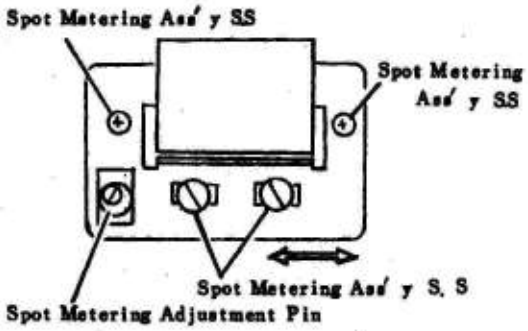

Fig. 187

〔B〕 Adjustment in vertical direction

⑦ Affix the spot check chart (Chart B) in the lying position. (Position the chart correctly.)

⑧ Turn the Sub-mirror Adjustment Screw and lock it where the Shutter speed is highest. (Lock the screw with Screw-Lock.) (See Fig. 184)

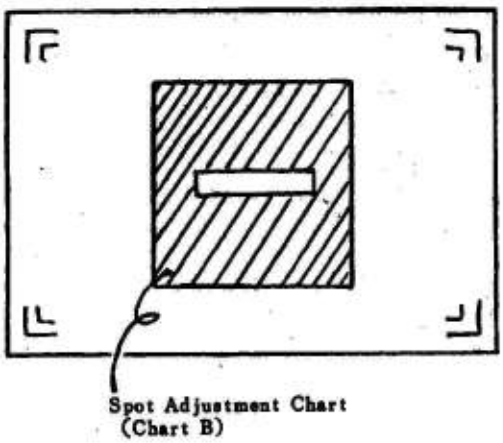

Fig. 188

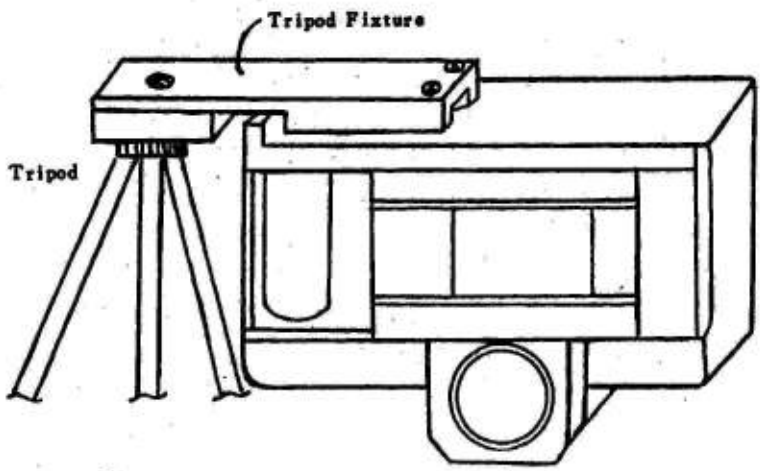

Fig. 189

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C-3-2 Adjustment of Perforation Position

* Use a non-exposed and developed Black and White film as a perforation position gauge.

1. With the main switch turned on, turn the Rewind Knob, while pressing the Rewind Lock Release Button, to perform rewinding.
2. Open the back cover and loosen the Sprocket Setscrews (66001136)×2 in the lower part of the sprocket. (See Fig. 160)

   Notes : a) Do not loosen the two sprocket setscrews in the upper part of the sprocket.

3. Close the back cover and perform film advance operation without film.
4. Tighten temporarily one of the two Sprocket Setscrews loosened in step 2.
5. Turn the sprocket counterclockwise (in the direction of film winding) until it is stopped.
6. Loosen the Sprocket Setscrew tightened temporarily..
7. Place the film for perforation position adjustment on the aperture and sprocket.
8. Make adjustment according to the procedure ① to ④ below. Tighten the Sprocket Setscrew.
9. Remove the film for perforation position adjustment.
10. Close the back cover and perform film advance operation without film.
11. Open the back cover and turn the sprocket counterclockwise until the sprocket is stopped. Then check the perforation position.

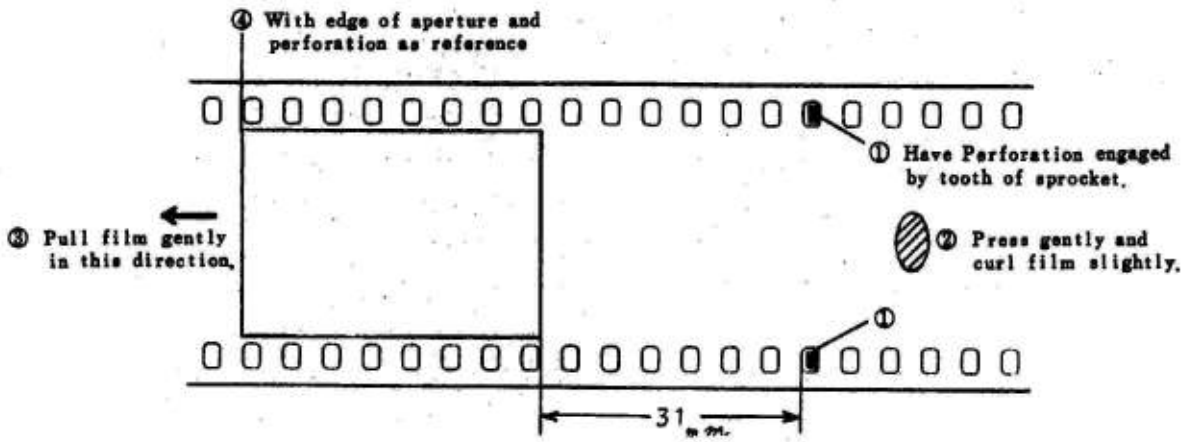
④ With edge of aperture and perforation as reference
① Have Perforation engaged by tooth of sprocket.
② Press gently and curl film slightly.
③ Pull film gently in this direction.
①
31 m/m

Fig. 190

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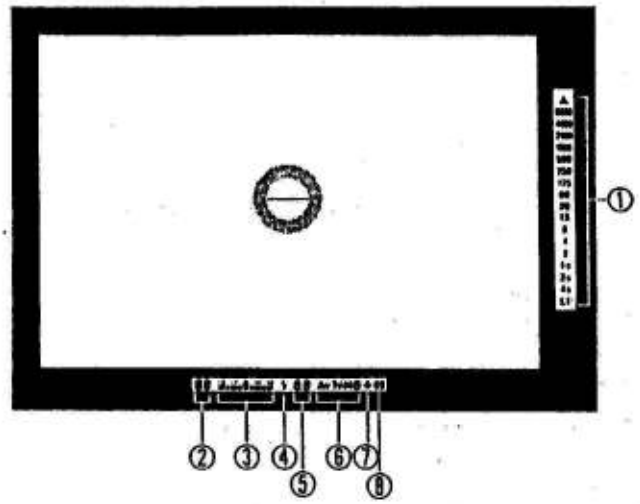
12. When the perforation position is proper, perform rewinding and tighten the other of the Sprocket Setscrews.

13. If the perforation position is not proper, loosen the Sprocket Setscrew and make adjustment again.

C-3-3 Adjustment of Viewfinder Display

Viewfinder Display



① Shutter speed
② Film counter
③ Pre-flash information
④ Flash status
⑤ Aperture
⑥ Exposure Mode
⑦ Exposure compensation warning
⑧ Metering mode

Fig. 191

* Position your eye at the center of the eyepiece and make adjustment so that the whole shutter display "▲" to "LT" is seen without eclipse.

① Adjust the Viewfinder Indicator Adjustment Screws (1AA82000)×2 so that the whole shutter display from left to right is seen without eclipse.

Note : a) After adjustment, lock the Viewfinder Indicator Adjustment Screws with Cemedine 551A.

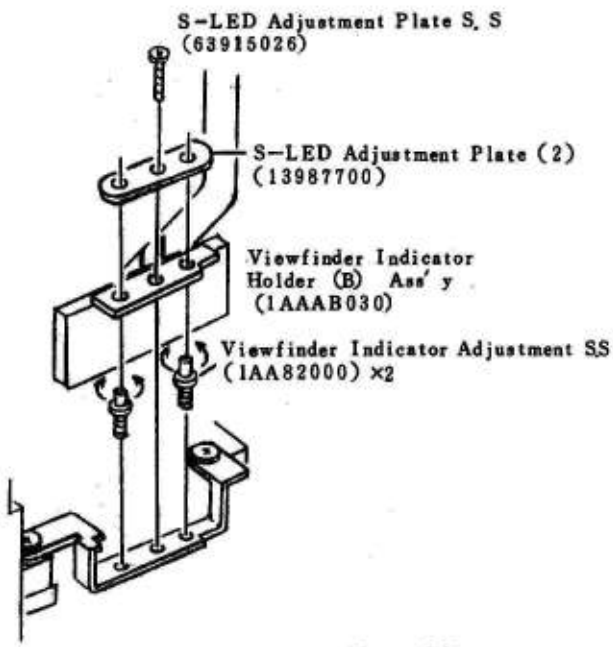


Fig. 192

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2. Adjustment of Viewfinder Indicator (A) Ass' y position

* Position your eye at the center of the eyepiece and make adjustment so that the whole display from the film counter to metering mode is seen without eclipse.

① Remove the Eye-piece Ass' y (1AAAA060) and Dioptric Adjustment Ass' y.

② Loosen the Viewfinder Indicator (A) Ass' y Setscrew (69112066)×2 and move the Viewfinder Indicator (A) Ass' y (1AAAB230) back and forth until it is positioned in parallel.

③ Install the Dioptric Adjustment Ass' y temporarily and make sure that the Viewfinder Indicator (A) Ass' y is in parallel.

Notes:

a) After adjustment, tighten the Viewfinder Indicator (A) Ass' y Setscrews gently and lock them with UV adhesive (epoxy resin adhesive).

b) Take care not to peel or damage the Viewfinder Indicator Prism (A) when installing the Viewfinder Indicator (A) Ass' y under the Penta Prism Holder.

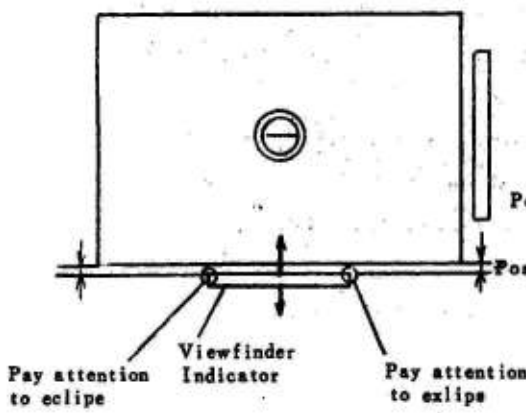

Fig. 193

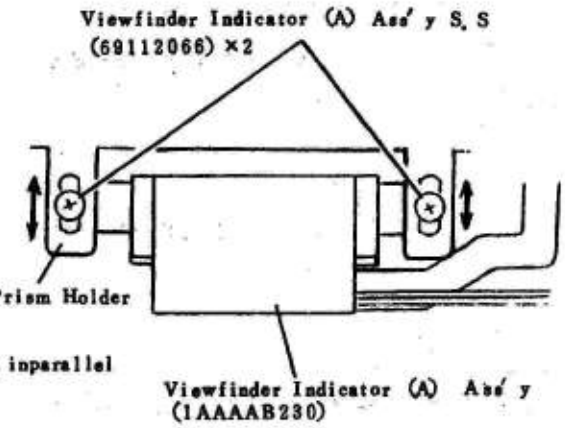
Viewfinder Indicator (A) Ass' y S. S (69112066) ×2
Penta Prism Holder
Position inparallel
Viewfinder Indicator (A) Ass' y (1AAAAB230)

Fig. 194

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C-3-4 Adjustment of Compensation Value

1. Setting of test mode

① Remove the Contact Pin Cover Setscrew (61912028)×3 and take off the Contact Pin Cover (1AA10600).

② Solder a lead wire to the TEST 1 terminal.

③ Connect the alligator crip to the GND terminal (camera body), and the camera will enter in test mode.

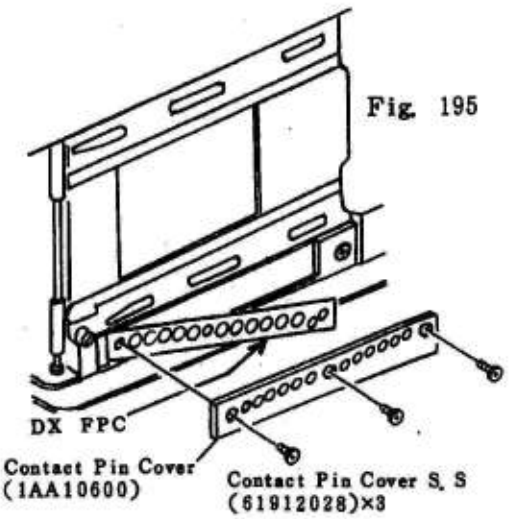

Fig. 195

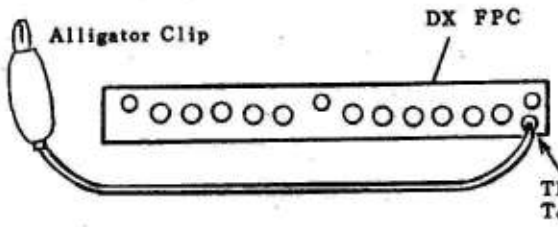

Fig. 196

In test mode, the camera performs the following operations depending on the setting positions of the drive mode switch:

S or CL or CH or MULTI-EX.:	Normal operation (No power-off after 16 seconds)
SELF 2 SEC:	Display and change of adjusted value
SELF 10 SEC:	Display of shutter operation count and automatic setting of adjusted ISO resistance Value

2. Display, Change and registration of adjusted values (write in EEPROM)

Drive mode = SELF 2 SEC

(1) Display of adjusted value

An adjusted value selected according to the shutter dial position is displayed in the film counter position.

With (-) data, the counter display and winding mark light up.

With (+) data, the counter only is displayed.

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Time Dial	Adjustment Items
8000	Shutter speed
4000	Aperture control delay pulse
2000	Flash control value
1000	Flash metering value
500	Reference average metering value
250	Average metering inclination
125	Reference spot metering value
60	Spot metering inclination
30	Reference aperture resistance value
15	Aperture resistance inclination
8	Reference ISO resistance value
4	ISO resistance inclination
2	Flash metering display
1S	Flash control display
2S	Battery check level B1 (Warning)
4S	Battery check level B2 (Operation stop)

Notes:
- o When the exposure mode switch is in the "Av B" position, no time setting is displayed in the viewfinder. (The operation in adjustment mode is the same as that in M Tv mode, except for the out of time setting display.)
- o The winding mark with (−) data is displayed in the external counter only. That is, there is no display representing (−) in the viewfinder.
- o When power is turned on by "TESTI = L" during power−off, the viewfinder indicator does not light up. In this case, change drive mode from SELF2 to another once, and the viewfinder indicator will light up.

(2) Change of adjusted value

With the adjusted value displayed, operate the release switch to change it.

Turn on the release switch with main switch in the "ON" position to increase the adjusted value by one.
Turn on the release switch with the main switch in the "AE Lock" position to decrease the adjusted value by one.

(3) Storage of adjusted value = Write in EEPROM

The adjusted value changed in (2) is stored in memory by writing in EEPROM. (Without write in EEPROM, the previous data is read and the new data is destroyed at power−on.)

Drive mode: SELF 2 SEC
Time dial : X 125

In these settings, the film counter displays 66. Under these conditions, turn on the release switch to write the current data in EEPROM.

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3. Shutter operation count display

Drive mode: SELF 10 sec
Time dial : 8000

In these settings, the film counter displays the shutter operation count in thousands. The figures below the position of the thousands are omitted.

Example:
When the shutter operation count is 12,800
The filme counter displays 12.

Note: The shutter operation count data is not changed by release operation.

4. Adjustment procedure

(1) Adjustment of aperture resistance

The aperture stop down setting value is detected by reading the resistance-divided voltage after A-D conversion.
For adjustment of the aperture resistance, the reference resistance value represents the difference between the A-D value and the theoretical value for zero aperture stop down (full-aperture position) and the adjusted resistance inclination value is the difference between the change in A-D value for 1/6 step and the theoretical value.

- The resolution of the adjusted reference value is 1LSB at A-D conversion, thus Vcc (about 5 V)/256 V. When the adjusted value increases by 5, the aperture stop down value increases by 1/6 step.

  Setting range: -127 to 128

- The resolution of the adjusted inclination value is 0.03125 ($=2^{-5}$).

  Setting range: -4 to 3.968 (Adjusted value: -128 to 127)

Mount a lens (Planner 50mm/1.4) and adjust the aperture resistance while looking at the aperture display in the viewfinder.

* LSB: Least significant bit, 1s digit

(1)-I Adjustment of Reference

Drive mode : SELF 2 SEC
Shutter dial: 30 (1/30 sec)
In these settings, the counter displays an adjusted reference value.

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① Set aperture to 1.4.
Press the release with the main switch in the "ON" position, and the adjusted value will increase by one. Increase the adjusted value so that the aperture display in the viewfinder changes from 1.4 to 1.7. At change to 1.7, record the adjusted value (film counter value).

② Change the position of the main switch to "AE−L" and press the release, and the adjusted value will decrease by one. Decrease the adjusted value so that the aperture display in the viewfinder changes from 1.4 to 1.2. At change to 1.2, record the adjusted value.

Note: When the aperture display is 1.7 or above at the beginning, make adjustment in the sequence of ② to ①. However, if the aperture display is very large like 64 or 27, make adjustment ① first. The display will change from 64 to 1.2 by increasing the adjusted value.

③ Calculate an adjusted value.

$$\frac{\text{(Adjusted value at change to 1.7)}-\text{(Adjusted value at change to 1.2)}}{2} = \text{Adjusted value}$$

④ Set the calculated value.

(1)−(II) Adjustment of Inclination (continued from (5)−I)

⑤ Set aperture to F16.
Set the shutter dial to 15 (1/15).
The film counter displays an adjusted inclination value.

⑥ Press the release with the main switch in the "ON" position, and the adjusted value will increase by one. Increase the adjusted value so that the aperture display in the viewfinder changes from 16 to 13. At change to 13, record the adjusted value (film counter value).

⑦ Change the position of the main switch to "AE−L" and press the release, and the adjusted value will decrease by one. Decrease the adjusted value so that the aperture display in the viewfinder changes from 16 to 22. At change to 22, record the adjusted value.

⑧ Calculate an adjusted value.

$$\frac{\text{(Adjusted value at change to 13)}-\text{(Adjust value at change to 22)}}{2} = \text{Adjusted value (Round to the nearest whole number.)}$$

⑨ Set the adjusted value.

⑩ Write the data in EEPROM.
Set the shutter dial to "X125" and press the release.

Note: If the display does not become normal even by change of the adjusted value, the open F. code is abnormal.
(Information: Aperture display = Open F. code + Aperture stop down value)

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(2) Adjustment of ISO resistance

The ISO setting value is detected by reading the resistance-divided voltage after A-D conversion.
For adjustment of the ISO resistance, the reference ISO resistance value represents the A-D value and the theoretical value for ISO 6400 and the adjusted ISO resistance inclination value is the difference between the change in A-D value at 1/3 step and the theoretical value.

The resolution of the adjusted reference value is 1LSB at A-D conversion, thus Vcc (5V)/256V. When the adjusted value increases by 5, the ISO value decreases by 1/3 step. The resolution of the adjusted inclination value is 0.03125 ($=2^{-5}$)

⑵-I Automatic setting of adiusted ISO resistance value

Perform the operations instructed below, and the camera will automatically calculate and set an adjusted reference value and inclination value.

Drive mode: SELF 10
Time dial : 8 (1/8 sec)
In these settings, the film counter displays "64".

① Set ISO to 6400. (The counter display "64" means ISO 6400.)
② Press the release, and the counter will display "06".
③ Set ISO to 6.
④ Press the release, and system will return to the initial state with the counter displaying "64".

When ① to ④ are executed, the camera automatically calculates the reference ISO resistance value and adjusted ISO resistance inclination value sets them. The camera does not perform writing in EEPROM. Therefore, perform writing in EEPROM after adjustment the same way as other adjustments.

⑤ Set drive mode to SELF 2 and the time dial to "X125". (Write mode)
The counter displays "66".
⑥ Press the release. (Execution of writing)

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(3) Adjustment of shutter speed : Adjustable range

7/8 to 0 TV (1/8000)
4/8 to −4/8 TV (1/4000)

At change of the adjusted value by one, the control time is adjusted by 0.125 TV.

Exposure mode =Manual
Time dial =8000

In these settings, measure time with a shutter tester and obtain an error expressed in a TV (EV) value.

Error = { Log (time) / Log (2) } − 7 (Unit of time: μs)

From the error, calculate an adjusted value as follows:

(Obtained error) / 0.125 = Adjusted value

Add this adjusted value to the preset adjusted value and write the summation in the camera. (See 2−(2))

Example:

① Check the adjusted shutter speed value. (See 2−(1))
② Change drive mode from SELF 2 SEC to CH and measure the shutter speed with a shutter tester.
③ Calculate an adjusted value.

Preset adjusted value = 3
When the time measured is 110 μs
Error = { Log (110) / Log (2) } − 7
= −0.219 TV
Adjusted value = −0.219 / 0.125
= −1.75
= −2 (rounded)
Final adjusted value = Preset adjusted value (checked in ①)
+ Newly obtained adjusted value
= 3 + (−2)
= 1

④ Return drive mode to SELF 2 SEC (counter displaying preset adjusted value "3") and set the main switch to "AE Lock" (to decrease the adjusted value).
⑤ Press the release two times.
Press of the release will change the counter display like 3→2→1 .
⑥ Change drive mode to CH and check the shutter speed.
⑦ Return drive mode to SELF 2 SEC and write the data in EEPROM. (See 2−(3))

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Note: o At 1/8000, no (−) data are taken into account. (−) data are effective at 1/4000 or below.

o When an error is obtained at 1/4000, double the error and calculate an adjusted value.

Allowable range of shutter speed

Time	Upper limit	Reference value	Lower limit
4"	4287.	4000.	3732.
2"	2143.	2000.	1866.
1/ 1	1071.	1000.	933.
1/ 2	535.8	500.0	466.5
1/ 4	267.9	250.0	233.2
1/ 8	138.6	125.0	112.6
1/ 15	69.34	62.50	56.32
1/ 30	34.67	31.25	28.16
1/ 60	17.33	15.62	14.08
1/ 125	8.66	7.81	7.04
1/ 250	4.64	3.90	3.28
1/ 500	2.32	1.95	1.64
1/1000	1.16	0.97	0.82
1/2000	0.601	0.488	0.397
1/4000	0.322	0.244	0.185
1/8000	0.173	0.122	0.086

Unit: ms

o Curtain travel speed

The first and second curtains travel the distance of 21㎜ in about 2.75ms (information only).

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(4) Adjustment of exposure

(Make the following adjustments for average metering and spot metering.)

Adjust the reference value at brightness of LV12 and then the inclination value at brightness of LV8

(4)-I Adjustment of reference exposure

Change of the adjusted value by one corrects 0.125EV.
Adjustable range: −16 to 15.875 EV

After adjustments (1), (2) and (3), change the adjusted inclination value to "00". (See 2-(2))
With exposure mode set to AV, measure the exposure error.
(LV12, aperture 5.6)
From the error, calculate an adjusted value as follows:

Exposure error / 0.125 = Adjusted value

Subtract this adjusted value from the preset adjusted value and write the resultant value in the camera. (See 2-(2))

Example:

① Check the adjusted reference exposure value.
(See 2-(1). Average metering: Time 500, Spot metering: Time 125)

② Change the adjusted exposure inclination value to "00".
(See 2-(2). Average metering: Time 250, Spot metering: Time 60)

③ Change drive mode from SELF 2 SEC to CH, set exposure mode to AV, aperture to 5.6 and measure exposure error with EE Tester.
(Brightness EE Tester LV12)

④ Calculate an adjusted value.

Preset adjusted value = 2
When the error measured is −0.3 EV
Adjusted value = −0.3 / 0.125
= −2.4
= −2 (rounded)
Final adjusted value = Preset adjusted value (check in ①)
− Newly obtained adjusted value
= 2 − (−2)
= 4

⑤ Return drive mode to SELF 2 SET (counter displaying preset adjusted value "2") and set the main switch to ON (to increase the adjusted value).

⑥ Press the release two times.
Press of the release will change the counter display like 2→3→4.

⑦ Change drive mode to CH and check the exposure.

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⑷−Ⅱ Adjustment of inclination

Adjust the inclination after adjustment of reference Eeposure made in Ⅰ.
Change of the adjusted value by one corrects the inclination by 1 + (adjusted value) × 2^{-7} times.
The reference position is LV12. By correction, the metering value will be decreased if the brightness is higher than LV12 or increased if the brightness is lower.

Adjustable range: 0.5 to 1.99 times

Example:

⑨ Set the brightness of the EE Tester to LV8 and measure the exposure error.

⑩ From the measured error, calculate an ajusted inclination value.

When error = 0.4 EV
Error × 9.143 = Adjusted value
(This formula can be used only at LV8.)
0.4 × 9.143 = 3.66
= 4

⑪ Return drive mode to SELF 2 and input the adjusted inclination value.

Average metering: Time 250, Spot metering: Time 60
(Press the release four times with the main switch in the "ON" position.)

⑫ Change drive mode to CH and check the exposure at LV12 and LV8.

⑬ If an error is found, repeat the above procedure from ①. When there is no error, return drive mode to SELF 2 and write the value in EEPROM.
(Time = X125, Release on, See 2−(3))

Note: When the adjusted value is decreased with the main switch in the "AE Lock" position, the metering value is locked. Therefore, return the main switch to "ON" when the exposure is to be checked after decrease of the adjusted value.

Auto exposure range

LV	Standard
LV 6	−0.4～+0.4EV
LV 8	−0.4～+0.4EV
LV12	−0.4～+0.4EV
LV15	−0.5～+0.5EV

K: 1.04 (K: 1.3)
ISO: 100 (ISO: 80)

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(5) Adjustment of aperture control delay pulse

Adjust the aperture control delay pulse after completion of (1) adjustment of shutter speed and (2) Adjustment of exposure. Change of the adjusted value by one corrects 0.125 AV.

Adiustable range: −6 to 0

The values 1 and above can be processed the same way. However, there is some trouble in other adjusted values if this adjusted value is (+).

Measure the exposure error in TV mode at setting time of 125 and brightness of LV12 and calculate an adjusted value as follows:

Adjusted value = Exposure error ／0.125

Subtract the calculated value from the preset value.

Example:

① Check the preset adjusted value of aperture control delay pulse. (See 2−(1). Time 4000)

② Set drive mode to CH, exposure mode to TV and shutter time to 125 and measure the exposure error with the EE Tester at LV12.

Preset adjusted value = −1
When exposure error = −0.25

③ Calculate an adjusted value.

Adjusted value = −0.25／0.125
= −2

④ Subtract the calculated value from the preset value.

Return drive mode to SELF 2, set the main switch to "AE Lock" and press the release two times. Each press of the release will cause change like −1 → −2 → −3.

⑤ Write the value in EEPROM.

Set the time to X125.
Press the release. See 2−(3)

* See the table on the previous page for Auto exposure range in TV mode.

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(6) Adjustment of flash control value

Adjust the flash control value after completion of (2) ISO resistance adjustment.
Change of the adjusted value by one corrects 1/3 EV.
Adjustable range: −8 to 0

There is no case where a plus value is input under normal conditions, because the center is deviated in the initial state.

In adjustment, mount a flash and perform flash control operation using the standard reflector as a subject. Make adjustment by intercepting all the light from outside.

① Mount the TLA280 on the camera and set the glancing angle to 50 and the mode switch to AUTO. Use normall flashing with one bulb.
② Set drive mode to S, exposure mode to AV, ISO to 100 and exposure compensation to 0.
③ Install the standard pressure plate on the aperture, mount the lens (Planar 50/f1.4) and set F−stop to F16.
④ Adjust the camera opsition so that the distance between the subject (standard reflector: reflectance 18%) and the film surface is 2.5m.
⑤ Under these conditions, press the release to light the flash. At this point, measure the exposure with the flash meter and check the error relative to the optimum value.
⑥ Change the adjusted value so that the error is −1±0.15EV.
⑦ After input of the adjusted value, light the flash and check the error again for confirmation.

Example:

If the error measured by lighting the flash is −1.6EV, input an adjusted value "−2" to change the error to −1.0EV. To input and store the adjusted value "−2",

⑧ Set drive mode to SELF 2 SEC and the shutter dial to 2000.
⑨ Set the main switch to "AEL" and press the release two times.
⑩ At press of the release, the counter display changes like 0 → 1 → 2 and the arrow indicating film advance lights up under the figure.
⑪ After confirmation of adjustment, set drive mode to X125 and press the release.

* If the standard pressure plate is not available, use the Kodak Ector Chrome 64.

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(7) Adjustment of flash metering value

Adjust the flash control value after completion of (2) ISO resistance adjustment.
Change of the adjusted value by one corrects 1/3 EV.

Adjustable range: −2 to +5

In adjustment, mount a flash and perform flash control operation using the standard reflector as a subject. Make adjustment by intercepting all the light from outside.

① Mount the TLA280 on the camera and set the glancing angle to 50 and the mode switch to AUTO. Use normal flashing with one bulb.
② Set exposure mode to AV, ISO to 100 and exposure compensation to 0.
③ Mount the lens (Planar 50/F1.4) and set F-stop to F4.
④ Adjust the camera position so that the distance between the subject (standard reflector: reflectance 18%) and the film surface is 2.5m.
⑤ Under these conditions, move the pre-flash lever to light the flash. At this point, measure the exposure with the flash meter and check the error relative to the optimum value.
⑥ Change the adjusted value so that the error is 0±0.15 EV.
⑦ After input of the adjusted value, light the flash and check the error again for confirmation.

Example:

If the error measured by lighting the flash is −1.6EV, input an adjusted value "−2" to change the error to −0.0EV. To input and store the adjusted value "−2",

⑧ Set drive mode to SELF 2 SEC and the shutter dial to 1000.
⑨ Set the main switch to "AEL" and press the release two times.
⑩ At press of the release, the counter display changes like 0 → 1 → 2 and the arrow indicating film advance lights up under the figure.
⑪ After confirmation of adjustment, set drive mode to X125 and press the release.

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(8) Adjustment of flash control display

Adjust the flash control display after completion of (2) ISO resistance adjustment and (7) flash control value adjustment.

Adjustable range: −127 to 127 (−7 EV to 1 EV)

EV value is not corrected in proportion to the change of the adjusted value. This is intended for adjustment of the data before EV conversion.

In adjustment, mount a flash and perform flash control operation using the standard reflector as a subject. Make adjustment by intercepting all the light from outside.

① Mount the TLA280 on the camera and set the glaneing angle to 50 and the mode switch to AUTO. Use normal flashing with one bulb.

② Set drive mode to S, exposure mode to AV, ISO to 100 and exposure compensation to 0.

③ Install the standard pressure plate on the aperture and mount the lens "Planar 50/f1.4".

④ Press the release to light the flash. At this point, change the adjusted value so that the error display in the viewfinder meets the following conditions:

Aperture	Distance (m)	Indication
F1.4	2.8	"Over" (all(+) data flickering) or "Proper"
F1.4	2.0	"Over" when "Proper" at 2.8m
F1.4	3.2	"Proper" when "Over" at 2.8m
F16	2.5	"Under" (all (−) data flickering)
F16	2.0	"Proper" when "Under" at 2.5m
F16	2.8	"Under" when "Proper" at 2.5m

⑤ Input an adjusted value on the plus side to move the indication to the "Over" side.
Input an adjusted value on the minus side to move the indication to the "Under" side.

⑥ The flash control value is displayed only for four seconds after flashing. Therefore, after inputting an adjusted value, you must release the shutter several times for confirmation.

⑦ Before releasing the shutter, wait until the flash is charged adequately.

⑧ Input the adjusted value with drive mode set to SELF 2 SEC and the shutter dial set to 2 (1/2 sec).

⑨ After determination of an adjusted value, set the shutter dial to X125 and write the value in EEPROM by pressing the release.

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(9) Adjustment of flash metering display

Adjust the flash control display after completion of (2) ISO resistance adjustment and (8) flash metering value adjustment.

Adjustable range: −127 to 127 (−7EV to 1EV)

EV value is not corrected in proportion to the change of the adjusted value. This is intended for adjustment of the data before EV conversion.

In adjustment, mount a flash and perform flash control operation using the standard reflector as a subject. Make adjustment by intercepting all the light from outside.

① Mount the TLA280 on the camera and set glancing angle to 50 and the mode switch to AUTO. e normal flashing with one bulb.
② Set exposure mode to Av, ISO to 100 and exposure compensation to 0.
③ Mount the lens (Planar 50/f1.4) and set F-stop to F4.
④ Adjust the camera position so that the distance between the subject (standard reflector: reflectance 18%) and the film surface is 2.0 m.
⑤ Move the pre-flash lever to light the flash. At this point, measure the error relative to the correct value with the flash meter. (The error must be nearly 0 EV. If not, make exposure adjustment again.)
⑥ With the pre-flash lever in the "ON" position, set drive mode to SELF2 and the shutter dial to 1 S. Under these conditions, the adjusted value can be changed.
⑦ Increase and decrease the adjusted value and find a value where the error indication in the viewfinder changes from "Correct" (0 position) to 0.5. (Value displayed at the film counter position. It is minus if the film advance mark is also lit.)
⑧ Calculate an adjusted value from the measurement results above and the formulas below.

P: Error measured with the flash meter (EV)
S: Adjusted value where the indication in the viewfinder changes from "Correct" to 0.5.

$$E1 = S + 128 \quad ①$$
$$E2 = E1 \times 7.8125E-03 \quad ②$$
$$E3 = \mathrm{Loge}\ E2 \quad [EV] \quad ③$$
$$E4 = E3 - (0.25 - P) \quad [EV] \quad ④$$
$$E5 = 2^{E4} \quad ⑤$$
$$E6 = E5 / 7.8125E-03 \quad ⑥$$
$$E7 = E6 - 128 \quad ⑦$$

The result of E7 rounded is the adjusted value.

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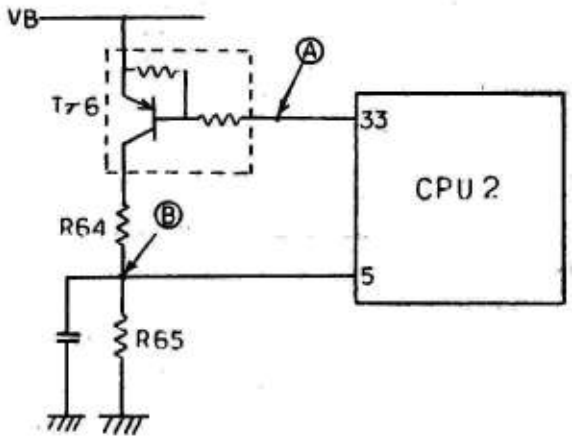
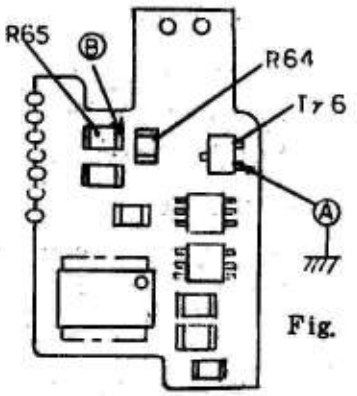
(10) Adjustment of B.C. (battery check) level

B.C. Circuit





R Drive FPC

Fig. 197

① Short the base terminal of the Tr6 to GND.

② Connect the ⊕ and ⊖ terminals of a Regulated DC Power Supply to the camera body. (See below)

③ Set the Regulated DC Power Supply to 5.0V or adove.

④ Turn on the main switch.

⑤ Reset the Regulated DC Power Supply to 4.5V.

* If the voltage is set to 4.5V at the beginning, the camera does not perform power hold. Once power hold is performed, it is performed even after lowering the voltage (about 3.2V).

⑥ Measure the voltage at the point Ⓑ ..... Input data 1

⑦ Measure the voltage V_{DD} (behind the filter)..... Input data 2

Input

Input data 1: B.C. voltage

Input data 2: V_{DD} voltage

⑧ Calculate an adjusted value.

$$\text{B1 adjusted value} = \frac{(\text{B.C. voltage})}{(V_{DD}\ \text{voltage})} \times 256 - 81$$

$$\text{B2 adjusted value} = (\text{B1 adjusted value}) + 14$$

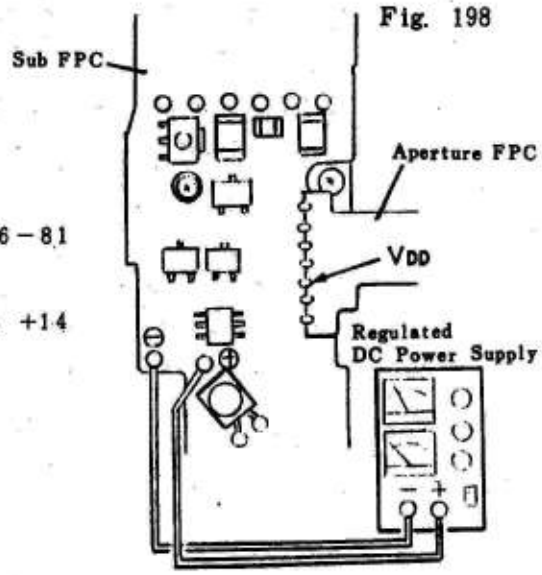


Fig. 198

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⑨ Write the calculated B1 and B2 values in EEPROM.
Set the time to X125.
Press the release. (See 2-(3))

Voltage	Display	Camera operation
4.5V	Mark not lit Counter display	Normal operation
4.2V	Mark lit Counter display	Normal operation (Battery warning)
	Mark flikering Counter No display	Operation stop

〔Notes for adjustment of compensation value〕

a) After replacing or repairing the main FPC ass' y, make adjustments (1) to (10).
b) After replacing or repairing the DC-DC converter, make adjustment of battery check level.
c) After replacing or repairing the ISO P.C. board, make adjustments (2) and (4) to (9).
d) After replacing or repairing the aperture P.C. board, make adjustments (1) and (4) to (9).
e) The adjustable range is −127 to 127, but the film counter displays −99 to 99. EEPROM permits writing of −127 to 127. Practically, however, adjusted values are small.
f) After completion of adjustments, remove all the solder from the TEST 1 terminal. If even a little solder remains, the contact cover is raised by the solder, thus spoiling the appearance.

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C-3-5 Check and Adjustment of Date Display Position

1. Check of date display position

① Install the date position check jig to the back cover hinge.

② Make sure that the date LCD is positioned within the slit in the jig.

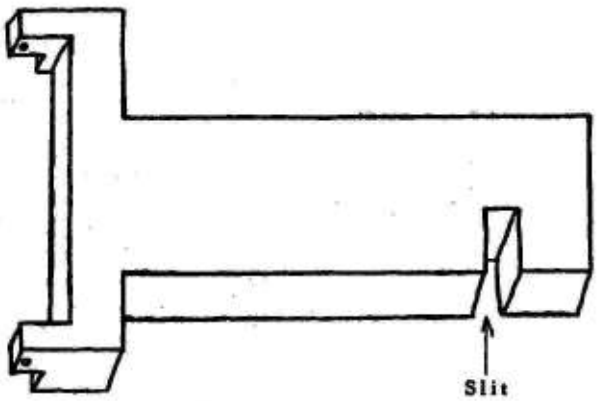

Fig. 199

〔Date Position Check Jig〕

2. Adjustment of date display position

* After replacing or repair the Date Module, adjust the date position as follows:

① Remove the Back Covering (1AA16010).

② Move the Date Module so that the date LCD is positioned within the slit in the jig.

③ After adjustment, lock the Date Module crazy glue or super glue.

C-3-6 X-synch Terminal

o Delay time

A range: 0.4ms or less (as sensing point at 21㎜)

B range: 1.0ms or more

o Contact effeiciency

70% or more for time of 1/250 seconds (Manual) or less

(Check with a 1 ms contact efficiency meter.)

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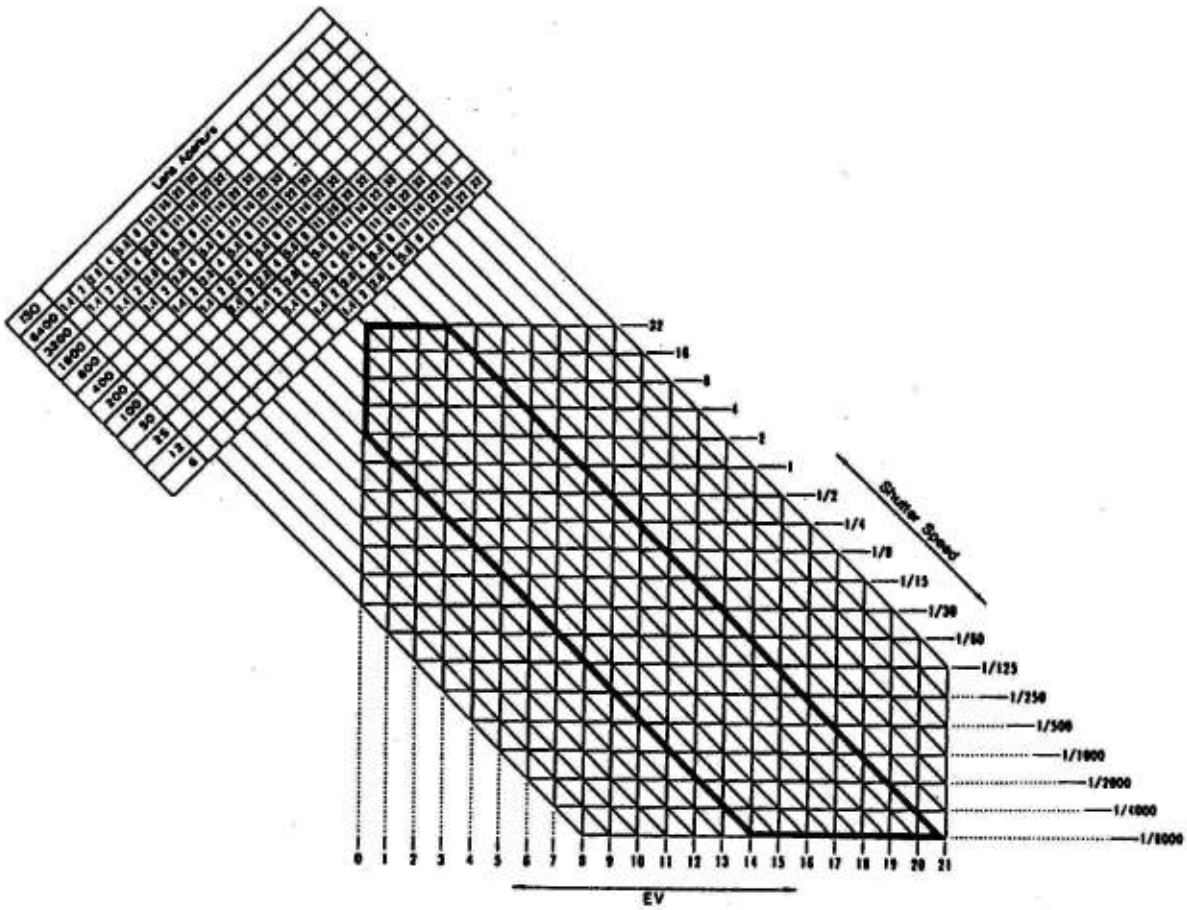
C-4 Others

〔Metering Linkage Chart〕



〔Current Consumption〕

Main Switch off (stand-by current)	30 μA or less
Main Switch on	80 mA or less
Winding	800 mA or less
Winding stop current	1200 mA or less
Rewinding	1000 mA or less

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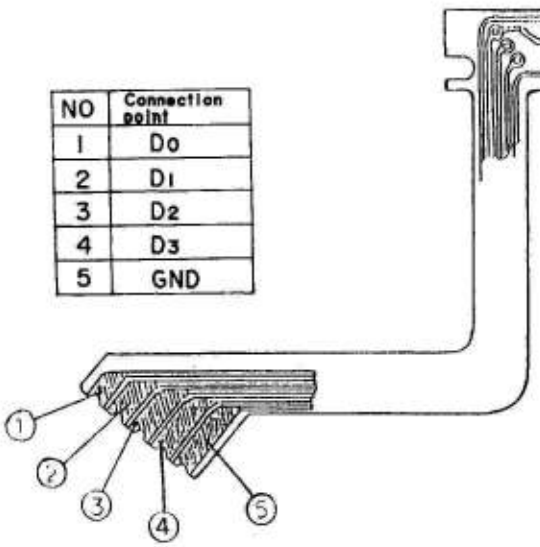
[Connection of Open F. Stop Signal FPC]

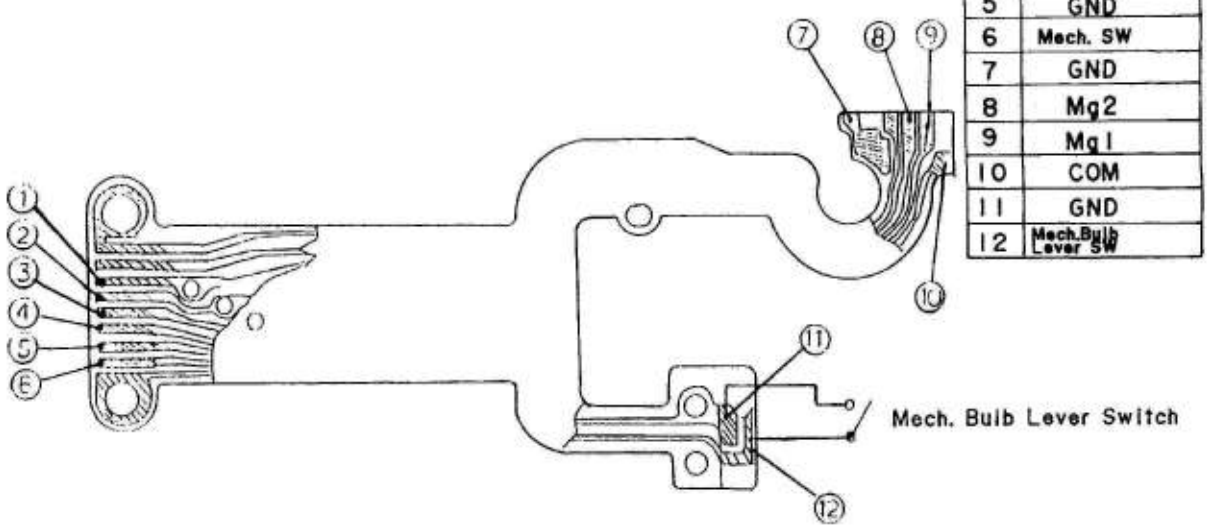


NO	Connection point
1	Do
2	D1
3	D2
4	D3
5	GND

NO	Do	D1	D2	D3	F value
1	1	0	0	0	1.2
2	1	1	0	0	1.4
3	0	1	0	0	1.7
4	0	1	1	0	2.0
5	1	1	1	0	2.4
6	1	0	1	0	2.8
7	0	0	1	0	3.5
8	0	0	1	1	4.0
9	1	0	1	1	4.8

* 0: Earth(GND potential)
  1: Power supply ⊕

[Connection of Shutter FPC Terminals]



NO	Name
1	Mg2
2	Mg1
3	VB
4	Second Curtain Complete SW
5	GND
6	Mech. SW
7	GND
8	Mg2
9	Mg1
10	COM
11	GND
12	Mech.Bulb Lever SW

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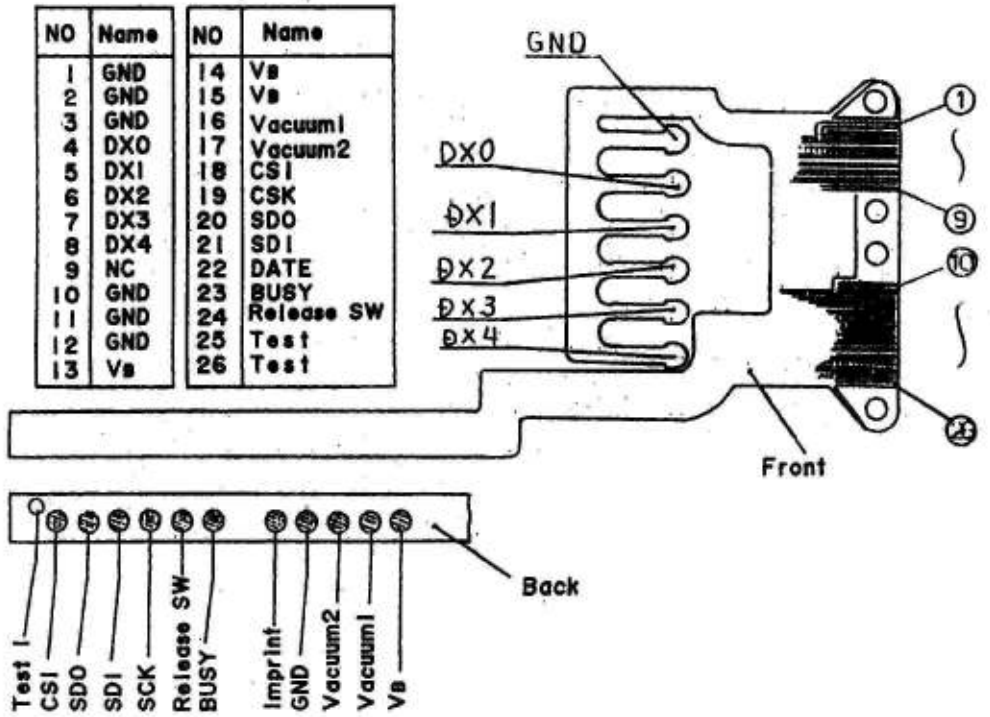
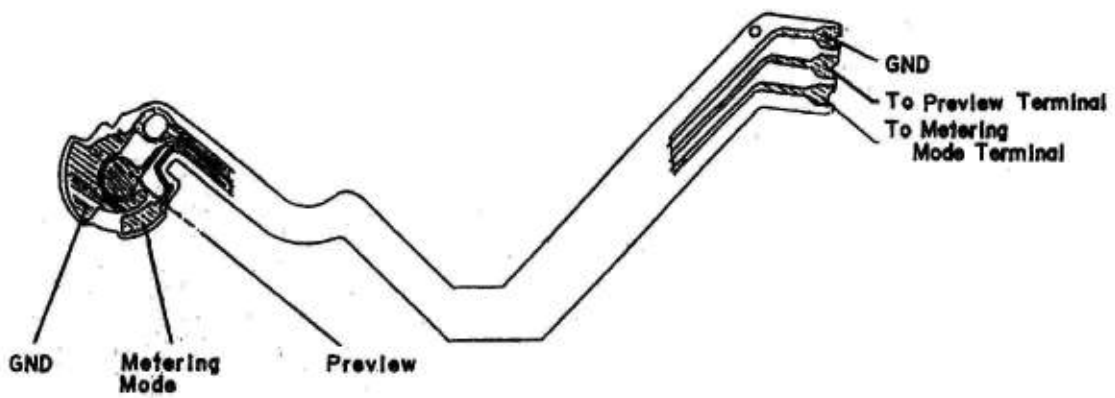
〔Connection of DX-FPC〕

NO	Name	NO	Name
1	GND	14	Vs
2	GND	15	Vs
3	GND	16	Vacuum1
4	DX0	17	Vacuum2
5	DX1	18	CS1
6	DX2	19	CSK
7	DX3	20	SDO
8	DX4	21	SD1
9	NC	22	DATE
10	GND	23	BUSY
11	GND	24	Release SW
12	GND	25	Test
13	Vs	26	Test



〔Connection of Metering Mode FPC〕



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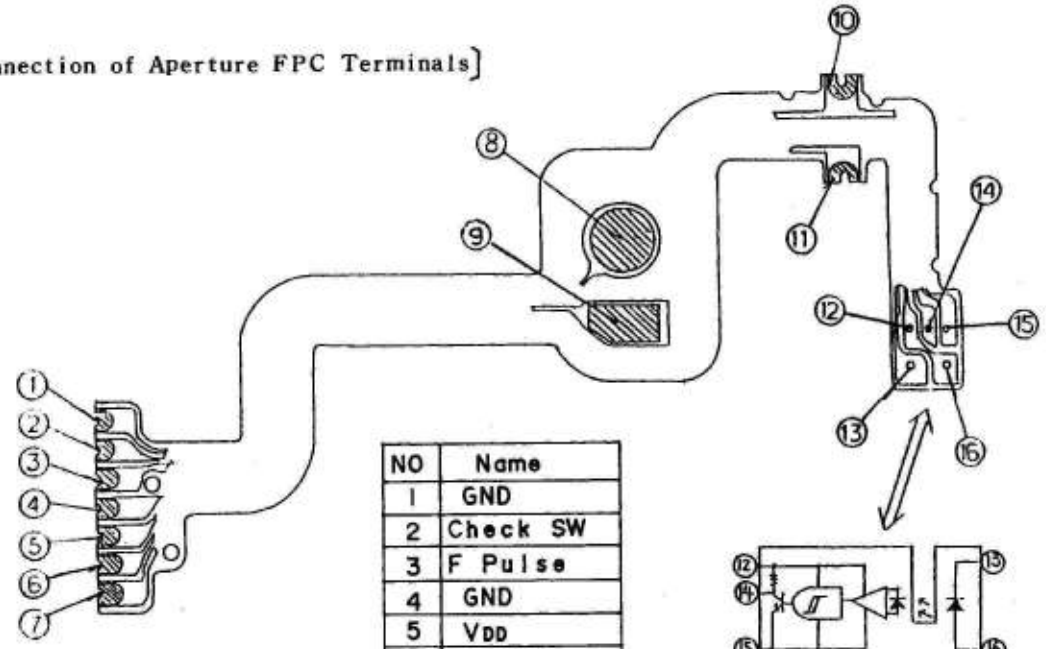
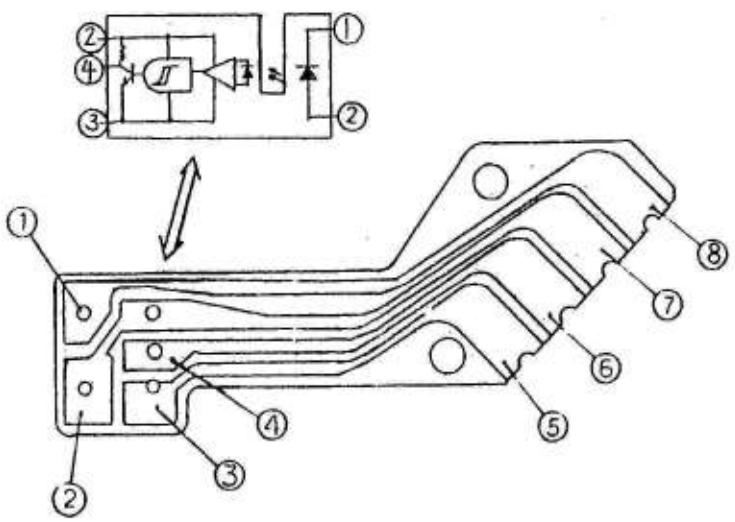
[Connection of Aperture FPC Terminals]



NO	Name
1	GND
2	Check SW
3	F Pulse
4	GND
5	VDD
6	F-LED
7	F-Mg
8	Check SW
9	GND
10	GND
11	F-Mg
12	VDD
13	FLED
14	F Pulse
15	GND
16	VDD

[Connection of Perforation FPC Terminals]



NO	Name
1	PF-LED
2	VDD
3	GND
4	PF-Pulse
5	GND
6	PF-Pulse
7	VDD
8	PF-LED

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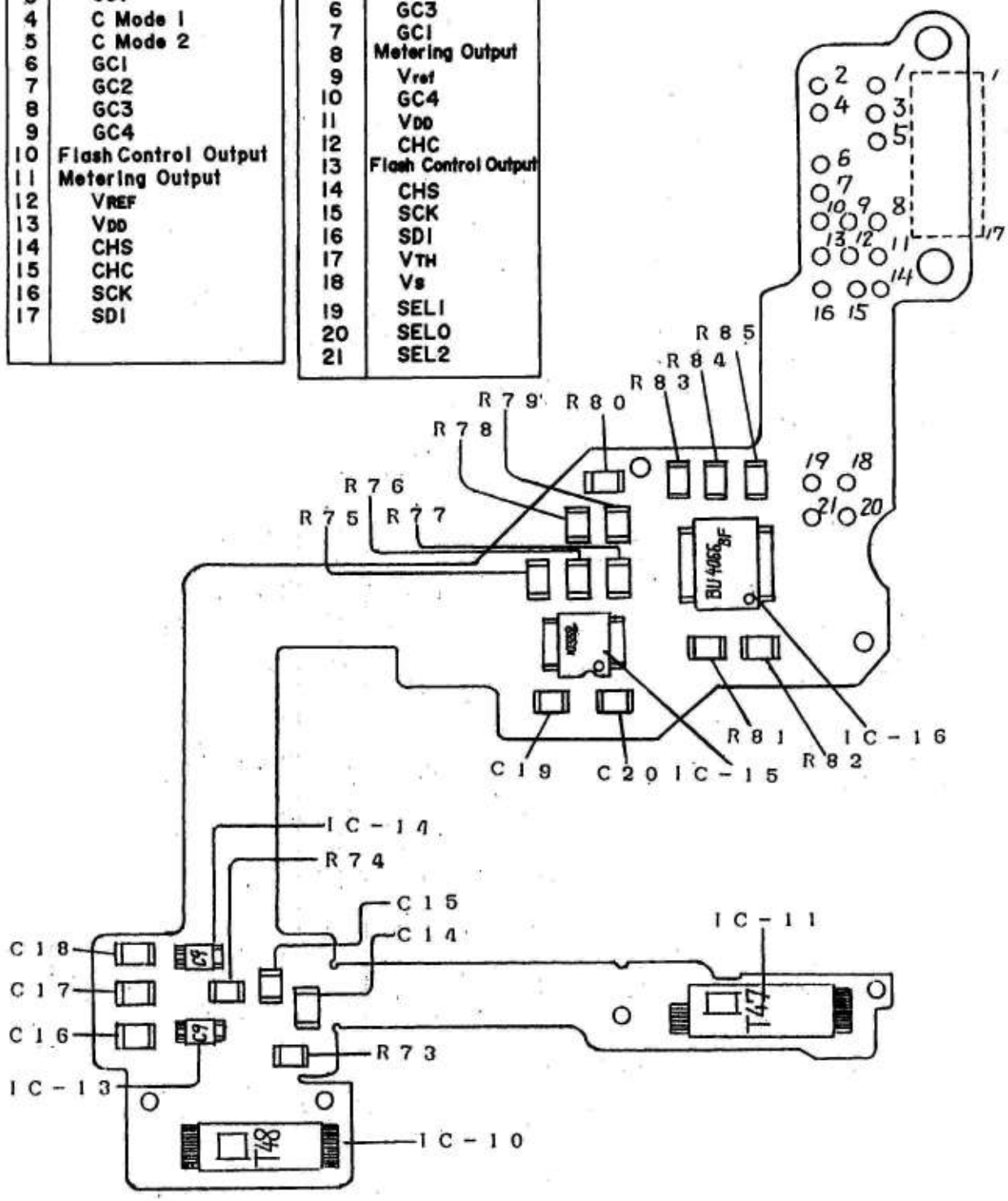
[Parts on Flash Control FPC]

Connector Terminals

NO	Terminal
1	GND
2	GND
3	CSI
4	C Mode 1
5	C Mode 2
6	GCI
7	GC2
8	GC3
9	GC4
10	Flash Control Output
11	Metering Output
12	VREF
13	VDD
14	CHS
15	CHC
16	SCK
17	SDI

Terminal	Test Point Name
1	CSI
2	GND
3	C Mode 2
4	C Mode 1
5	GC2
6	GC3
7	GCI
8	Metering Output
9	Vref
10	GC4
11	VDD
12	CHC
13	Flash Control Output
14	CHS
15	SCK
16	SDI
17	VTH
18	Vs
19	SEL1
20	SEL0
21	SEL2



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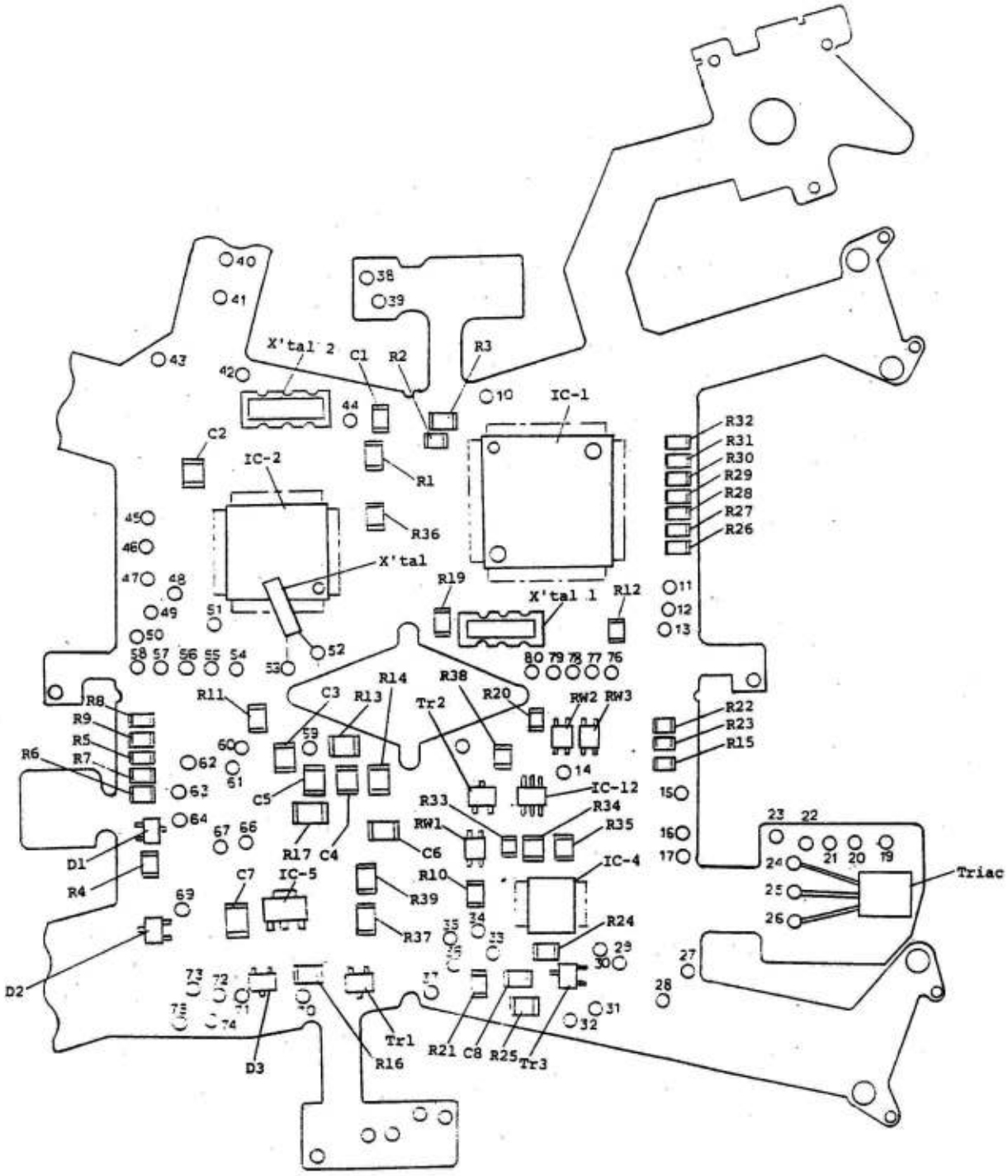

Main FPC Test Point

NO	Test Point
1	Time Code 1
2	Time Code 3
3	Release Socket
4	Time Code 5
5	GND
6	Time Code 4
7	Time Code 2
8	Exposure Code 2
9	Exposure Code 1
10	FL Meter
11	D1
12	D2
13	D3
14	8MHz
15	DO
16	S OUT
17	Ø2
18	SCK
19	GND
20	X
21	X
22	X
23	X
24	X
25	Tnyristor (Ga)
26	GND
27	Ø1
28	TEST 1
29	RCK
30	WCK
31	BRQ
32	Thyristor (Ga)
33	CS1
34	SD1
35	AX
36	CH1/O
37	GND
38	Vref
39	Metering Output
40	DX

NO	Test Point
41	ISO
42	ABC(1EV)
43	Compensation (+)
44	4M (Xout)
45	TEST2
46	S9
47	S11
48	ABC(0.5EV)
49	Compensation (-)
50	SIO
51	AE Lock
52	32KHz
53	32KHz
54	Metering Mode
55	Preview
56	GND
57	Vpp
58	Aperture
59	32KHz
60	Reset
61	SELF Control
62	Back Cover SW
63	Check SW
64	Dcc
65	LOCK (Main)
66	Vcc
67	Release
68	—
69	Rewind SW
70	GND
71	Va
72	Mg 1
73	Mg 2
74	Second Curtain Completion SW
75	Mech. Bulb SW
76	Open F Code 1
77	Open F Code 2
78	Open F Code 3
79	Open F Code 4
80	GND

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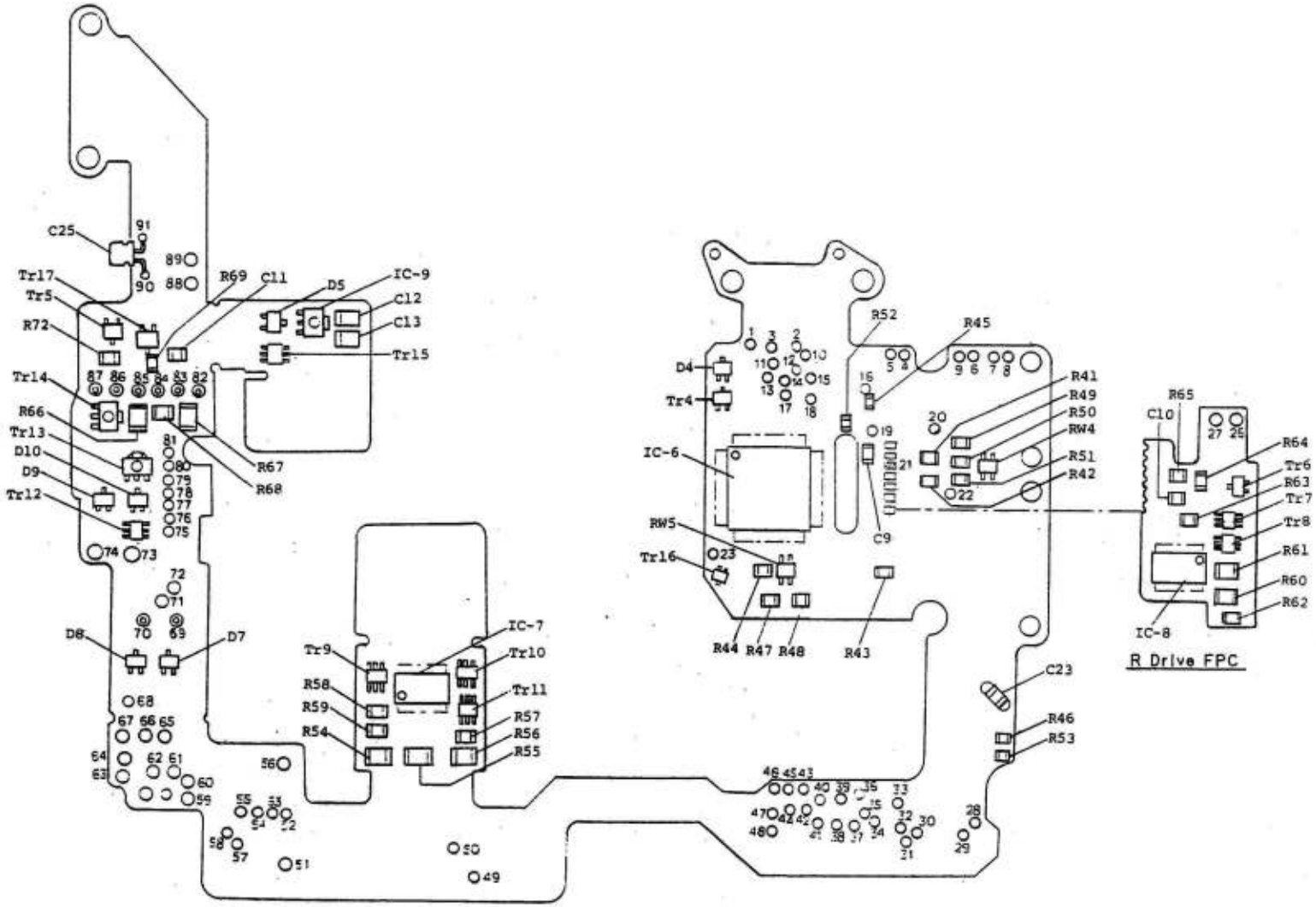
Parts on Sub FPC Ass' y



Sub FPC Test Point

NO	Test Point
1	GND
2	D2
3	Reset input
4	DXO
5	DXI
6	SDO (CPU I)
7	CSI (CPU I)
8	SCK (CPU I)
9	SDI (CPU I)
10	DI
11	BM (Oscillator)
12	D3
13	BRQ
14	WCK
15	DO
16	DX2
17	RCK
18	M-UP SW
19	DX4
20	DX3
21	(BCC present)
22	GND
23	Vacuum 2
24	GND
25	Back Cover SW
26	Rewind Motor (Red)
27	Rewind Motor (Black)
28	Release SW
29	GND
30	CHG2
31	CHGI
32	F-Mg Control
33	Charge SW
34	WBK
35	Revolving Limit SW
36	PF-LED
37	WIND
38	Charge SW
39	Φ 1
40	Φ 2
41	F Open SW
42	F Close SW
43	PF Pulse
44	GND
45	F-LED
46	F Pulse

NO	Test Point
47	Revolving Limit
48	BRK
49	GND
50	M-UP SW
51	Vdd
52	GND
53	PF-Pulse
54	Vdd
55	PF-LED
56	GND
57	Vs (Plunger)
58	Plunger
59	Revolving Limit SW
60	GND
61	GND
62	Rewind SW
63	Charge Motor
64	Charge Motor (-)
65	GND
66	Check SW(Vertical)
67	Release SW
68	SELF LED
69	GND
70	DCDC input
71	SELF LED (A)
72	SELF LED (K)
73	Vs
74	GND
75	F-Mg
76	F-LED
77	Vdd
78	GND
79	F-Pulse
80	Check SW
81	GND
82	ELVo
83	EL (GND)
84	Vo
85	GND
86	EL Lock
87	PH
88	Winding Motor
89	Winding Motor(+)
90	GND
91	Charge SW

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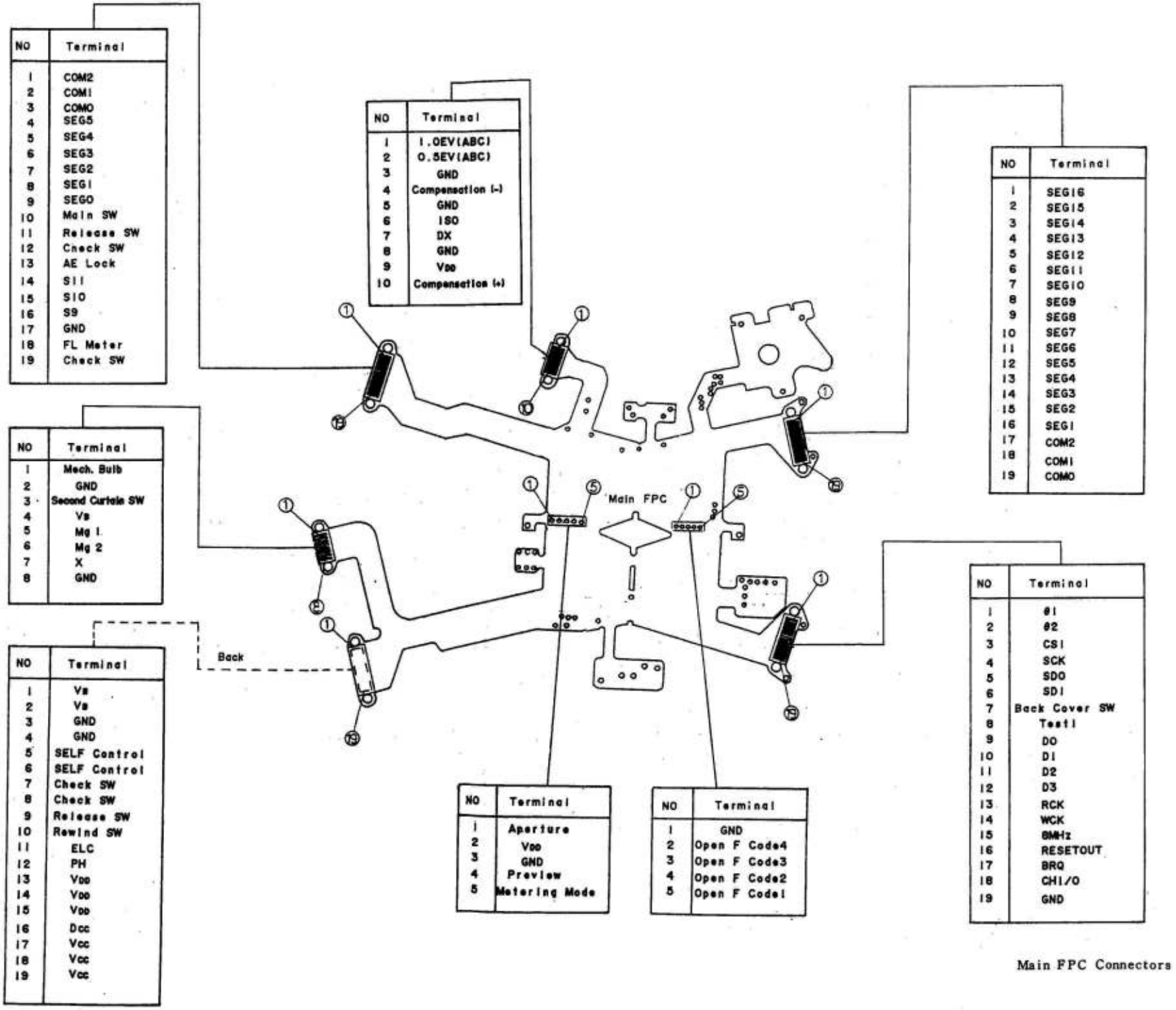

NO	Terminal
1	COM2
2	COM1
3	COM0
4	SEG5
5	SEG4
6	SEG3
7	SEG2
8	SEG1
9	SEG0
10	Main SW
11	Release SW
12	Check SW
13	AE Lock
14	S11
15	S10
16	S9
17	GND
18	FL Meter
19	Check SW

NO	Terminal
1	1.0EV(ABC)
2	0.5EV(ABC)
3	GND
4	Compensation (-)
5	GND
6	ISO
7	DX
8	GND
9	Vdd
10	Compensation (+)

NO	Terminal
1	SEG16
2	SEG15
3	SEG14
4	SEG13
5	SEG12
6	SEG11
7	SEG10
8	SEG9
9	SEG8
10	SEG7
11	SEG6
12	SEG5
13	SEG4
14	SEG3
15	SEG2
16	SEG1
17	COM2
18	COM1
19	COM0

NO	Terminal
1	Mech. Bulb
2	GND
3	Second Curtain SW
4	Vs
5	Mg 1
6	Mg 2
7	X
8	GND

NO	Terminal
1	Vs
2	Vs
3	GND
4	GND
5	SELF Control
6	SELF Control
7	Check SW
8	Check SW
9	Release SW
10	Rewind SW
11	ELC
12	PH
13	Vdd
14	Vdd
15	Vdd
16	Dcc
17	Vcc
18	Vcc
19	Vcc

NO	Terminal
1	Aperture
2	Vdd
3	GND
4	Preview
5	Metering Mode

NO	Terminal
1	GND
2	Open F Code4
3	Open F Code3
4	Open F Code2
5	Open F Code1

NO	Terminal
1	Ø1
2	Ø2
3	CS1
4	SCK
5	SDO
6	SDI
7	Back Cover SW
8	Test1
9	DO
10	D1
11	D2
12	D3
13	RCK
14	WCK
15	8MHz
16	RESETOUT
17	BRQ
18	CH1/O
19	GND

Main FPC Connectors

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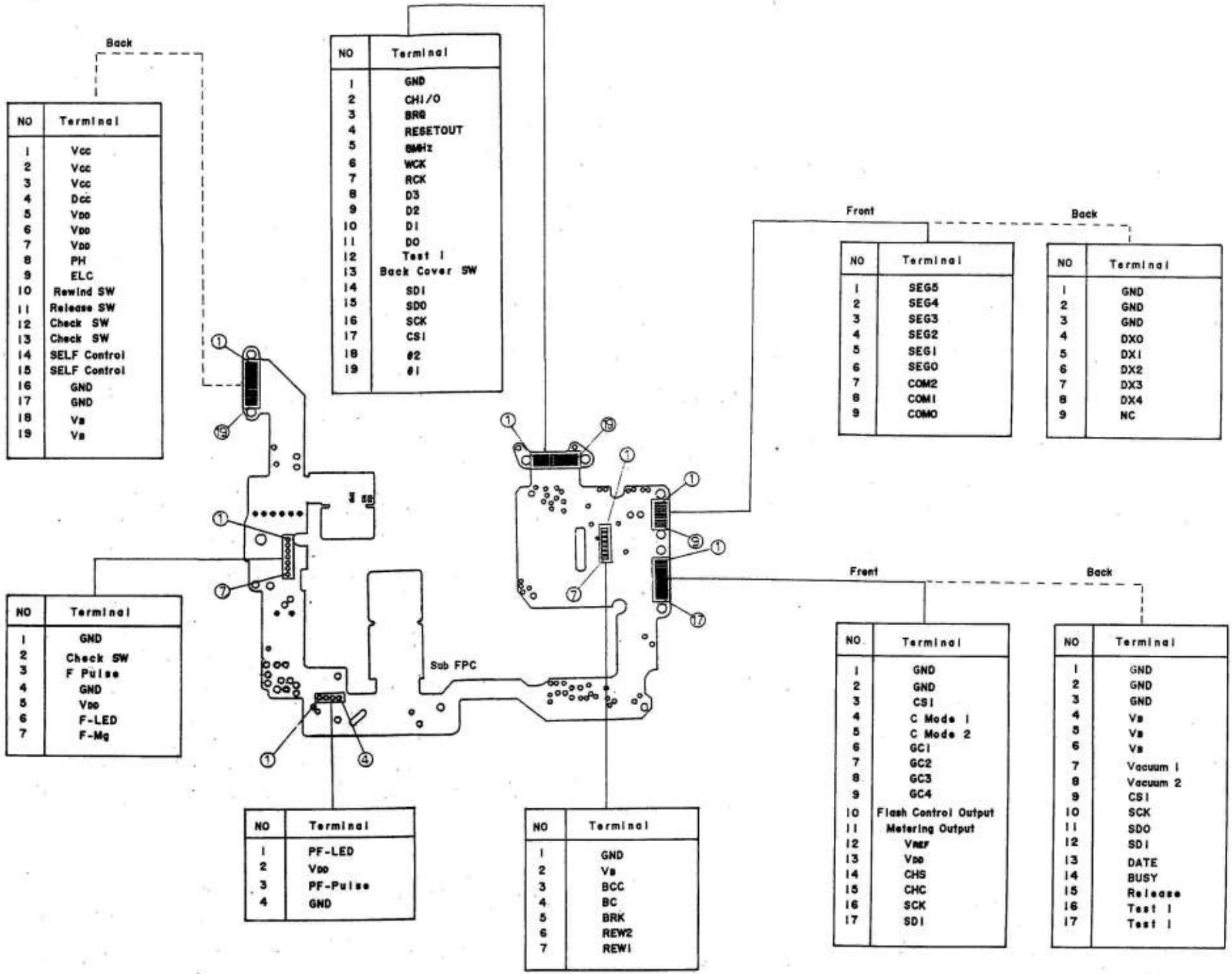

Sub FPC Connectors

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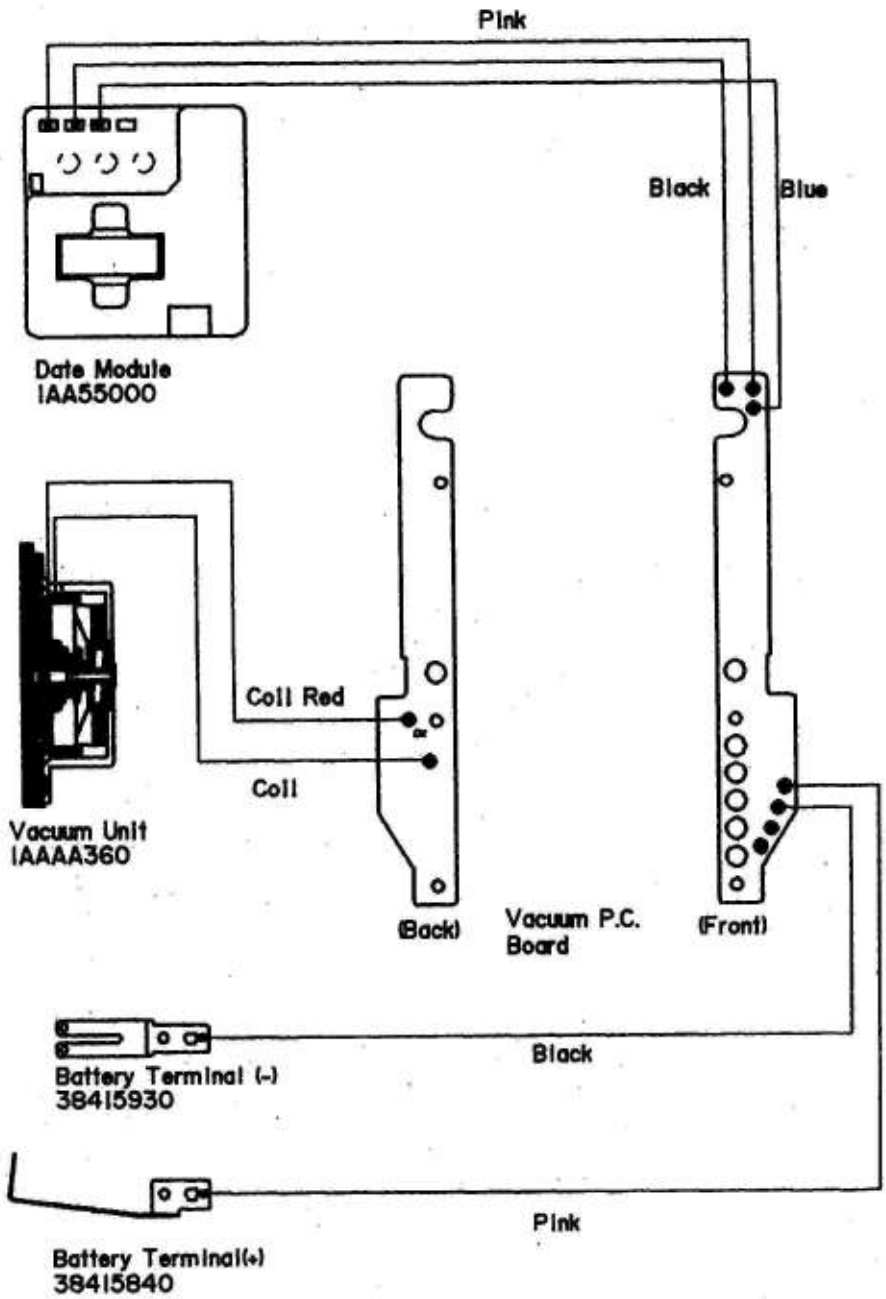
RTS Ⅲ Back Cover Wiring Diagram



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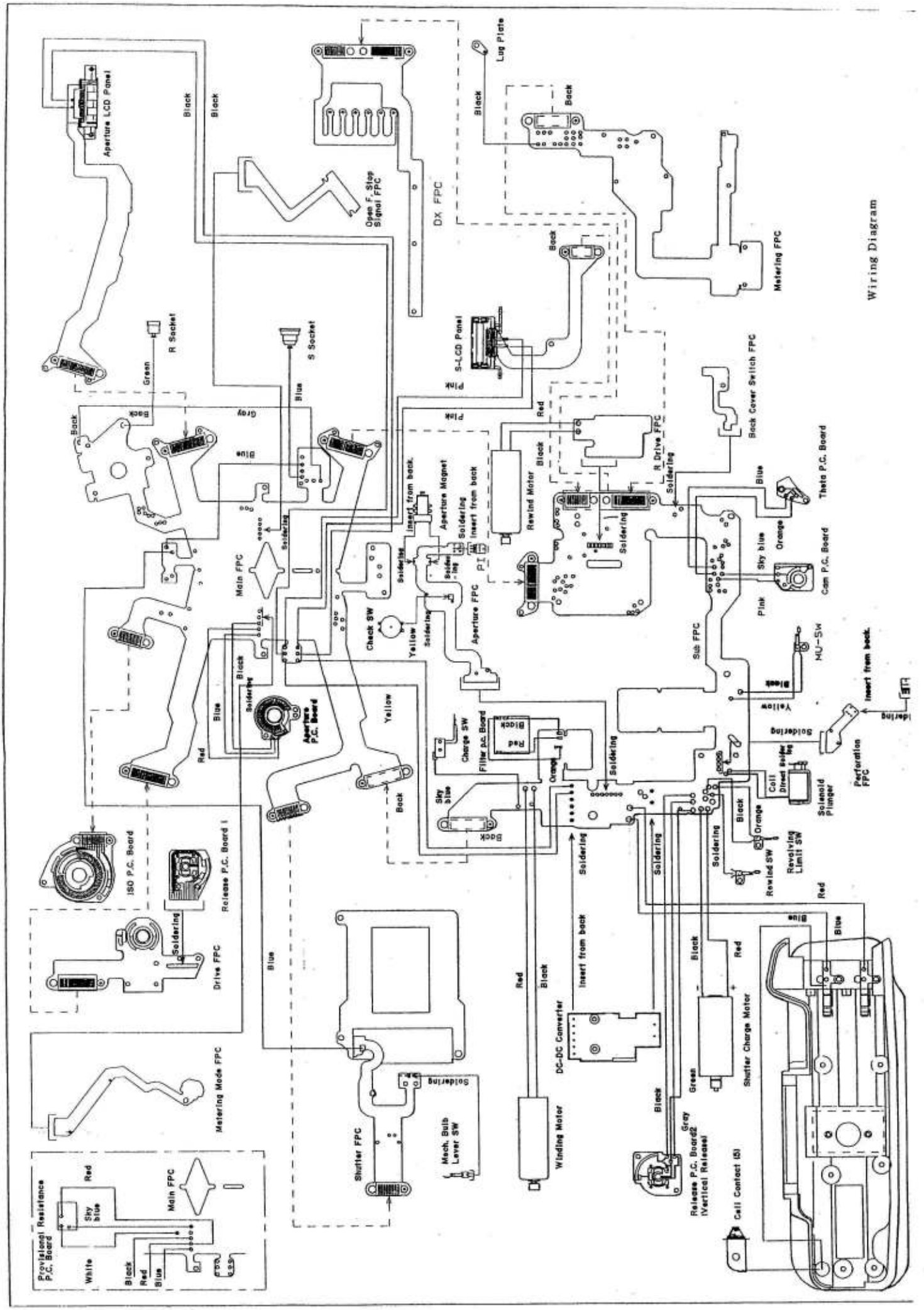

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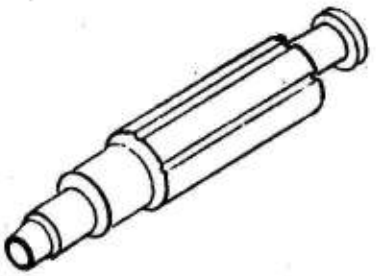
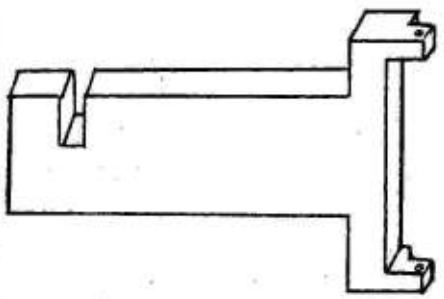
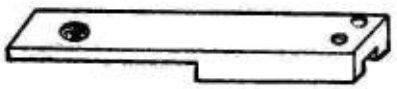
List of Special Tools

Tools for tightening sprocket and mode drive dial	
Name: 0.89mm w. cross flat hex wrench No. CL-4000	
Name: Clock driver with wooden handle and cover	
Tools for checking and adjusting date display position	
Name: Date position check jig	
Tool for installing tripod and camera dody	
Name: Tripod fixture	

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